HISTORY OF SUMATRA,

CONTAINING AN ACCOUNT OF

THE GOVERNMENT, LAWS, CUSTOMS, AND MANNERS

OF

THE NATIVE INHABITANTS.

WITH

A DESCRIPTION OF THE NATURAL PRODUCTIONS,

AND A RELATION OF THE

ANCIENT POLITICAL STATE OF THAT ISLAND.

BY

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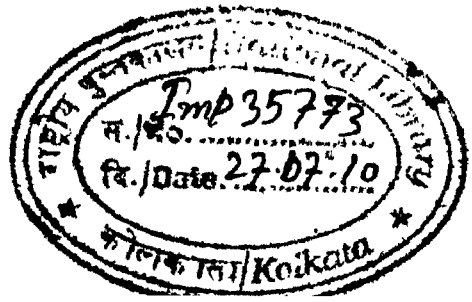

PREFACE

THE island of SUMATRA, which, in point of situation and extent, holds a conspicuous rank on the terraqueous globe, and is surpassed by few in the bountiful indulgences of nature, has in all ages been unaccountably neglected by writers; insomuch, that it is at this day less known, as to the interior parts more especially, that the remotest island of modern discovery; although it has been constantly resorted to by Europeans for some centuries, and the English have had a regular establishment there for the last hundred years. It is true that the commercial importance of Sumatra has much declined. It is no longer the Emporium of Eastern riches, whither the traders of the West resorted with their cargoes, to exchange them for the precious merchandise of the Indian Archipelago: nor does it boast now the political consequence it acquired, when the rapid progress of the Portuguese successes there first received a check. That enterprising people, who caused so many kingdoms to shrink from the terrour of their arms, met with nothing but disgrace in their attempts against Achin, whose monarchs made them tremble in their turn. Yet still the importance of this island, in the eye of the natural historian, has continued undiminished, and has equally, at all periods, laid claim to an attention, that does not appear, at any, to have been paid to it.

The Portuguese being better warriors than philosophers, and more eager

eager to conquer nations than to explore their manners or antiquities, it is not surprising that they should have been unable to furnish the world with any particular and just description of a country which they must have regarded with an evil eye. The Dutch were the next people from whom we had a right to expect information. They had an early intercourse with the island, and have at different times formed settlements in almost every part of it; yet they are almost silent with respect to its history.* But to what cause are we to ascribe the remissness of our own countrymen, whose opportunities have been equal to those of their predecessors or cotemporaries? It seems difficult to account for it; but the fact is, that, excepting a short sketch of the manners prevailing in a particular district of the island, published in the Philosophical Transactions of the year 1778, not one page of information respecting the inhabitants of Sumatra has been communicated to the public by any Englishman who has resided there.

To form a general and tolerably accurate account of this country and its inhabitants, is a work attended with great and peculiar difficulties. The necessary information is not to be procured from the people themselves, whose knowledge and inquiries are to the last degree confined, scarcely extending beyond the bounds of the district where they first drew breath; and but very rarely have the almost impervious woods of Sumatra

* At the period when this remark was written, I was not aware that an account of the Dutch settlements and commerce in Sumatra, by M. Adolph Eschels-kroon, had in the preceding year been published at Hamburgh, in the German language; nor had the transactions of a literary society, established at Batavia, whose first volume appeared there in 1779, yet reached this country. The work, indeed, of Valentyn, containing a general history of the European possessions in the East Indies, should have exempted a nation to which oriental learning is largely indebted, from what I now consider as an unmerited reflection.

Sumatra been penetrated, to any considerable distance from the sea coast, by Europeans, whose observations have been then imperfect; trusted perhaps to memory only; or if committed to paper, lost to the world by their deaths. Other difficulties arise from the extraordinary diversity of national distinctions, which, under a great variety of independent governments, divide this island in many directions; and yet not from their number merely, nor from the dissimilarity in their languages or manners, does the embarrassment entirely proceed: the local divisions are perplexed and uncertain; the extent of jurisdiction of the various princes is inaccurately defined; settlers from different countries, and at different periods, have introduced an irregular, though powerful influence, that supersedes in some places the authority of the established governments, and imposes a real dominion on the natives, where a nominal one is not assumed. This, in a course of years, is productive of innovations that destroy the originality and genuineness of their customs and manners, obliterate ancient distinctions, and render confused the path of an investigator.

These objections, which seem to have hitherto proved unsurmountable with such as might have been inclined to attempt the history of Sumatra, would also have deterred me from an undertaking apparently so arduous, had I not reflected, that those circumstances in which consisted the principal difficulty, were in fact the least interesting to the public, and of the least utility in themselves. It is of but small importance to determine with precision, whether a few villages on this or that particular river belong to one petty chief or to another; whether such a nation is divided into a greater or lesser number of tribes; or which of two neighbouring powers originally did homage to the other for its title. History is only to be prized as it tends to improve our knowledge of mankind, to which such investigations contribute in a very small degree.

I have

I have therefore attempted rather to give a comprehensive, than a circumstantial description of the divisions of the country into its various governments; aiming at a more particular detail, in what respects the customs, opinions, arts, and industry of the original inhabitants, in their most genuine state. The interests of the European powers who have established themselves on the island; the history of their settlements, and of the revolutions of their commerce, I have not considered as forming a part of my plan; but these subjects, as connected with the accounts of the native inhabitants, and the history of their governments, are occasionally introduced.

I was principally encouraged to this undertaking by the promises of assistance I received from some ingenious, and very highly esteemed friends, who resided with me in Sumatra. It has also been urged to me here in England, that as the subject is altogether new, it is a duty incumbent on me, to lay the information I am in possession of, however defective, before the public, who will not object to its being circumscribed, whilst its authenticity remains unimpeachable. This last quality is that which I can with the most confidence take upon me to vouch for. The greatest portion of what I have described, has fallen within the scope of my own immediate observation; the remainder is either matter of common notoriety to every person residing in the island, or received upon the concurring authority of gentlemen, whose situation in the East India Company's service, long acquaintance with the natives, extensive knowledge of their language, ideas, and manners, and respectability of character, render them worthy of the most implicit faith that can be given to human testimony.

I have been the more scrupulously exact in this particular, because my view was not, ultimately, to write an entertaining book, to which the

the marvellous might be thought not a little to contribute, but sincerely and conscientiously to add the small portion in my power, to the general knowledge of the age; to throw some glimmering light on the path of the naturalist; and more especially to furnish those philosophers, whose labours have been directed to the investigation of the history of Man, with facts to serve as *data* in their reasonings, which are too often rendered nugatory, and not seldom ridiculous, by assuming as truths, the misconceptions, or wilful impositions of travellers. The study of their own species is doubtless the most interesting and important that can claim the attention of mankind; and this science, like all others, it is impossible to improve by abstract speculation, merely. A regular series of authenticated facts is what alone can enable us to rise towards a perfect knowledge in it. To have added one new and firm step in this arduous ascent, is a merit of which I should be proud to boast.

Of this third edition it is necessary to observe, that the former two having made their appearance so early as the years 1783 and 1784, it would long since have been prepared for the public eye, had not the duties of an official situation occupied for many years the whole of my attention. During that period, however, I received from my friends abroad various useful, and, to me at least, interesting communications, which have enabled me to correct some inaccuracies, to supply deficiencies, and to augment the general mass of information on the subject of an island still but imperfectly explored. To incorporate these new materials requiring that many liberties should be taken with the original contexture of the work, I became the less scrupulous of making further alterations, wherever I thought they could be introduced with advantage

tage. The branch of natural history in particular I trust will be found to have received much improvement, and I feel happy to have had it in my power to illustrate several of the most interesting productions of the vegetable and animal kingdoms by engravings executed from time to time, as the drawings were procured, and which are intended to accompany the volume in a separate atlas.

THE

HISTORY OF SUMATRA.

Situation—Name—General Description of the Country, its Mountains, Lakes, and Rivers—Air and Meteors—Monsoons, and Land and Sea-Breezes—Minerals and Fossils—Volcanos—Earthquakes—Surfs and Tides.

IF antiquity holds up to us some models, in different arts and sciences, which have been found inimitable; the moderns, on the other hand, have carried their inventions and improvements, in a variety of instances, to an extent and a degree of perfection, of which the former could entertain no ideas. Among those discoveries in which we have stept so far beyond our masters, there is none more striking, or more eminently useful, than the means which the ingenuity of some, and the experience of others, have taught mankind, of determining with certainty and precision the relative situation of the various countries of the earth. What was formerly the subject of mere conjecture, or at best of vague and arbitrary computation, is now the clear result of settled rule, founded upon principles demonstratively just. It only remains for the liberality of princes and states, and the persevering industry of navigators and travellers, to effect the application of these means to their proper end, by continuing to ascertain the unknown and uncertain positions of all the parts of the world, which the barriers of nature will allow the skill and industry of man to approach.

SUMATRA.

Situation of the island.

SUMATRA, the subject of the present work, is an extensive island in the East Indies, the most western of those which may be termed the Malayan Archipelago, and constituting its boundary on that side. The equator divides it obliquely, its general direction being north-west and south-east, into almost equal parts; the one extremity lying in five degrees thirty-three minutes north, and the other, in five degrees fifty-six minutes south latitude. In respect to relative position, its northern point stretches into the bay of Bengal; its south-west coast is exposed to the great Indian ocean; towards the south it is separated by the straits of Sunda from the island of Java; on the east, by the commencement of the Eastern and China seas, from Borneo and other islands; and on the north-east, by the straits of *Malacca*, from the peninsula of *Malayo*, to which, according to a tradition noticed by the Portuguese historians, it is supposed to have been anciently united.

Latitude.

Longitude.

The only point of the island whose longitude has been settled by actual observation, is Fort Marlborough, near Bencoolen, the principal English settlement, standing in three degrees forty-six minutes of south latitude. From eclipses of Jupiter's satellites observed in June 1769, preparatory to an observation of the transit of the planet Venus over the sun's disc, Mr. Robert Nairne calculated its longitude to be 101° 42′ 45″; which was afterwards corrected by the Astronomer Royal to 102° east of Greenwich. The situation of *Achin* Head is pretty accurately fixed by computation at 95° 34′; and longitudes of places in the straits of Sunda are well ascertained by the short runs from Batavia, which city has the advantage of an observatory. By the general use of chronometers in latter times, the means have been afforded of determining the positions of many prominent points both on the eastern and western coasts, by which the

Map.

map of the island has been considerably improved: but particular surveys, such as those of the bays and islets from *Batang-kapas* to *Padang*, made with great ability by Captain (now Lt. Col.) John Macdonald; of the coast from *Priaman* to the islands off *Achin* by Capt. George Robertson; and of *Siak* River by Mr. Francis Lynch, are much wanted; and the interior of the country is still very imperfectly known. From sketches of the routes of Mr. Charles Campbell and of Lieut. Hastings Dare, I have been enabled to delineate the principal features of the *Sarampei*, *Sungei Tenang*

Tenàng and *Korinchi* countries, inland of *Ipu*, *Moco-Moco*, and *Indrapura*; and advantage has been taken of all other information that could be procured. For the general materials from which the map is constructed, I am chiefly indebted to the kindness of my friend, the late Mr. Alexander Dalrymple, whose indefatigable labours during a long life, have contributed more than those of any other person to the improvement of Indian Hydrography. It may be proper to observe, that the map of Sumatra, to be found in the fifth volume of Valentyn's great work, is so extremely incorrect, even in regard to those parts immediately subject to the Dutch government, as to be quite useless.

Unknown to the ancients.

Notwithstanding the obvious situation of this island, in the direct track from the ports of India to the spice islands and to China, it seems to have been unknown to the Greek and Roman geographers, whose information or conjectures carried them no farther than *Selan-dib* or Ceylon, which has claims to be considered as their *Taprobane*; although, during the middle ages, that celebrated name was almost uniformly applied to Sumatra. The single circumstance, indeed, of the latter being intersected by the equator (as Taprobane was said to be) is sufficient to justify the doubts of those who were disinclined to apply it to the former; and whether in fact the obscure and contradictory descriptions given by Strabo, Pomponius Mela, Pliny, and Ptolemy, belonged to any actual place, however imperfectly known; or whether, observing that a number of rare and valuable commodities were brought from an island or islands in the supposed extremity of the East, they might have been led to give place in their charts to one of vast extent, which should stand as the representative of the whole, is a question not to be hastily decided.

Taprobane.

Ophir.

The idea of Sumatra being the country of *Ophir*, whither Solomon sent his fleets for cargoes of gold and ivory, rather than to the coast of *Sofala*, or other part of Africa, is too vague, and the subject wrapt in a veil of too remote antiquity, to allow of satisfactory discussion; and I shall only observe, that no inference can be drawn from the name of *Ophir* found in maps, as belonging to a mountain in this island and to another in the peninsula; these having been applied to them by European navigators, and the word being unknown to the natives.

Until the discovery of the passage to India by the Cape of Good Hope, the identity of this island, as described or alluded to by writers, is often equivocal, or to be inferred only from corresponding circumstances.

Arabian travellers.

The first of the two Arabian travellers of the ninth century, the account of whose voyages to India and China was translated by Renaudot from a manuscript written about the year 1173, speaks of a large island called *Ramni*, in the track between *Sarandib* and *Sin* (or China), that from the similarity of productions has been generally supposed to mean Sumatra; and this probability is strengthened by a circumstance I believe not hitherto noticed by commentators. It is said to divide the sea of *Herkend*, or Indian ocean, from the sea of *Shelahet* (*Salahet* in Edrisi), and *Salát* being the Malayan term both for a strait in general, and for the well-known passage within the island of *Singapura* in particular, this may be fairly presumed to refer to the straits of Malacca.

Edrisi.

Edrisi, improperly called the Nubian geographer, who dedicated his work to Roger, king of Sicily, in the middle of the twelfth century, describes the same island, in the first climate, by the name of *Al-Rami*; but the particulars so nearly correspond with those given by the Arabian traveller, as to shew that the one account was borrowed from the other. He, very erroneously, however, makes the distance between *Sarandib* and that island to be no more than three days' sail, instead of fifteen. The island of *Soborma*, which he places in the same climate, is evidently *Borneo*, and the two passages leading to it, are the straits of Malacca and of Sunda. What is mentioned of *Sumandar*, in the second climate, has no relation whatever to Sumatra, although from the name we are led to expect it.

Marco Polo.

MARCO POLO, the celebrated Venetian traveller of the thirteenth century, is the first European who speaks of this island, but under the appellation of *Java minor*, which he gave to it by a sort of analogy, having forgotten, or not having learned from the natives, its appropriate name. His relation, though for a long time undervalued, and by many considered as a romantic tale, and liable as it is to the charge of errors and

and omissions, with some improbabilities, possesses, notwithstanding, strong internal evidence of genuineness and good faith. Containing few dates, the exact period of his visit to Sumatra cannot be ascertained, but as he returned to Venice in 1295, and possibly five years might have elapsed in his subsequent tedious voyages and journeys by Ceylon, the Karnatick, Malabar, Guzerat, Persia, the shores of the Caspian and Euxine, to Genoa (in a prison at which place he is said to have dictated his narrative), we may venture to refer it to the year 1290.

Taking his departure, with a considerable equipment, from a southern port of China, which he (or his transcriber) named *Zaitum*, they proceeded to *Ziamba (Tsiampa* or *Champa*, adjoining to the southern part of *Cochin-china)* which he had previously visited in 1280, being then in the service of the emperor *Kublai Khan*. From thence, he says, to the island of *Java major* is a course of fifteen hundred miles, but it is evident that he speaks of it only from the information of others, and not as an eye-witness; nor is it probable that the expedition should have deviated so far from its proper route. He states truly that it is a mart for spices, and much frequented by traders from the southern provinces of China. He then mentions in succession the small uninhabited islands of *Sondur* and *Condur* (perhaps *Pulo Condore*); the province of *Boëach* otherwise *Lochac* (apparently *Camboja*, near to which Condore is situated); the island of *Petan* (either *Patani* or *Pahang* in the peninsula) the passage to which, from *Boëach*, is across a gulf (that of *Siam*); and the kingdom called *Malaiur* in the Italian, and *Maletur* in the Latin version, which we can scarcely doubt to be the *Malayan* kingdom of *Siñga-pura*, at the extremity of the peninsula, or *Malacca*, then beginning to flourish. It is not, however, asserted that he touched at all these places, nor does he seem to speak from personal knowledge, until his arrival at *Java minor* (as he calls it) or Sumatra. This island, lying in a south-eastern direction from *Petan* (if he does not rather mean from *Malaiur*, the place last mentioned) he expressly says he visited, and describes it as being in circumference two thousand miles (not very wide of the truth in a matter so vague), extending to the southward so far as to render the polar star invisible, and divided into eight kingdoms, two of which he did not see,

and

and the six others he enumerates as follows: *Ferlech*, which I apprehend to be *Parlak*, at the eastern extremity of the northern coast, where they were likely to have first made the land. Here he says the people in general were idolaters; but the Saracen merchants who frequented the place had converted to the faith of Mahomet the inhabitants of the towns, whilst those of the mountains lived like beasts, and were in the practice of eating human flesh. *Basma* or *Basman:* this nearly approaches in sound to *Pasaman* on the western coast, but I should be more inclined to refer it to *Pasē* (by the Portuguese written *Paçem*) on the northern. The manners of the people here, as in the other kingdoms, are represented as savage; and such they might well appear to one who had long resided in China. Wild elephants are mentioned, and the rhinoceros is well described. *Samara:* this I suppose to be *Samar-lañga*, likewise on the northern coast, and noted for its bay. Here, he says, the expedition, consisting of two thousand persons, was constrained to remain five months, waiting the change of the monsoon; and being apprehensive of injury from the barbarous natives, they secured themselves, by means of a deep ditch, on the land side, with its extremities embracing the port, and strengthened by bulwarks of timber. With provisions they were supplied in abundance, particularly the finest fish. There is no wheat, and the people live on rice. They are without vines, but extract an excellent liquor from trees of the palm kind, by cutting off a branch, and applying to it a vessel, which is filled in the course of a day and night. A description is then given of the Indian or coco-nut. *Dragoian*, a name bearing some, though not much resemblance to *Indra-giri*, on the eastern coast; but I doubt his having proceeded so far to the southward as that river. The customs of the natives are painted as still more atrocious in this district. When any of them are afflicted with disorders pronounced by their magicians to be incurable, their relations cause them to be suffocated, and then dress and eat their flesh; justifying the practice by this argument, that if it were suffered to corrupt and breed worms, these must presently perish, and by their deaths subject the soul of the deceased to great torments. They also kill and devour such strangers caught amongst them as cannot pay a ransom. *Lambri* might be presumed a corruption of *Jambi*, but the circumstances related do not justify the analogy. It is said to produce camphor, which is not found

to

to the southward of the equinoctial line; and also *verzino*, or red-wood, (though I suspect *benzuin* to be the word intended), together with a plant which he names *birci*, supposed to be the *bakam* of the Arabs, or sappan wood of the eastern islands, the seeds of which he carried with him to Venice. In the mountainous parts were men with tails a palm long; also the rhinoceros, and other wild animals. Lastly, *Fanfur* or *Fansur*, which corresponds better to *Campar* than to the island of *Panchur*, which some have supposed it. Here the finest camphor was produced, equal in value to its weight in gold. The inhabitants live on rice, and draw liquor from certain trees, in the manner before described. There are likewise trees that yield a species of meal. They are of a large size, have a thin bark, under which is a hard wood about three inches in thickness, and within this the pith, from which, by means of steeping and straining it, the meal (or sago) is procured, of which he had often eaten with satisfaction. Each of these kingdoms is said to have had its peculiar language. Departing from *Lambri*, and steering northward from *Java minor*, one hundred and fifty miles, they reached a small island named *Necuram* or *Norcueran* (probably *Nancowry*, one of the *Nicobars*), and afterwards an island named *Angaman (Andaman)*, from whence steering to the southward of west a thousand miles, they arrived at that of *Zeilan* or *Seilam*, one of the most considerable in the world.—The editions consulted are chiefly the Italian of Ramusio, 1583, Latin of Müller, 1671, and French of Bergeron, 1735, varying much from each other in the orthography of proper names.

ODORICUS, a friar, who commenced his travels in 1318, and died at Padua in 1331, had visited many parts of the East. From the southern part of the coast of Coromandel he proceeded by a navigation of twenty days, to a country named *Lamori* (perhaps a corruption of the Arabian *Al-rami*), to the southward of which is another kingdom named *Sumoltra*, and not far from thence a large island named Java. His account, which was delivered orally to the person by whom it was written down, is extremely meagre and unsatisfactory. Odoricus.

MANDEVILLE, who travelled in the fourteenth century, seems to have Mandeville.

have adopted the account of Odoricus, when he says, "Beside the yle of *Lemery* is another that is clept *Sumabor*; and fast beside, a great yle clept *Java*."

N. di Conti. NICOLO DI CONTI, of Venice, returned from his oriental travels in 1449, and communicated to the secretary of Pope Eugenius IV. a much more consistent and satisfactory account of what he had seen, than any of his predecessors. After giving a description of the cinnamon and other productions of *Zeilam*, he says he sailed to a great island named *Sumatra*, called by the ancients *Taprobana*, where he was detained one year. His account of the pepper-plant, of the *durian* fruit, and of the extraordinary customs, now well ascertained, of the *Batech* or *Batta* people, prove him to have been an intelligent observer.

Itinerarium Portugallens. A small work entitled Itinerarium Portugallensium, printed at Milan in 1508, after speaking of the island of *Sayla*, says, that to the eastward of this there is another called *Samotra*, which we name Taprobane, distant from the city of Calechut about three months' voyage. The information appears to have been obtained from an Indian of Cranganore, on the coast of Malabar, who visited Lisbon in 1501.

Ludovico Barthema. LUDOVICO BARTHEMA (Vartoma) of Bologna, began his travels in 1503, and in 1505, after visiting *Malacca*, which he describes as being the resort of a greater quantity of shipping than any other port in the world, passed over to *Pedir* in *Sumatra*, which he concludes to be Taprobane. The productions of the island, he says, were chiefly exported to Catai or China. From Sumatra he proceeded to Banda and the Moluccas, from thence returned by Java and Malacca to the west of India, and arrived at Lisbon in 1508.

Odoardus Barbosa. ODOARDUS BARBOSA, of Lisbon, who concluded the journal of his voyage in 1516, speaks with much precision of Sumatra. He enumerates many places, both upon the coast, and inland, by the names they now bear, among which he considers *Pedir* as the principal; distinguishes between the Mahometan inhabitants of the coast and the Pagans of the inland

inland country; and mentions the extensive trade carried on by the former with *Cambaia* in the west of India.

In the account given by Antonio Pigafetta, the companion of Ferdinando de Magaglianes, of the famous circumnavigatory voyage performed by the Spaniards in the years 1519—22, it is stated, that from their apprehension of falling in with Portuguese ships, they pursued their westerly route from the island of *Timor*, by the *Laut Kidol*, or southern ocean, leaving on their right hand the island of *Zamatra* (written in another part of the journal, *Somatra*) or Taprobana of the ancients. Mention is also made of a native of that island being on board, who served them usefully as an interpreter in many of the places they visited; and we are here furnished with the earliest specimen of the Malayan language. Antonio Pigafetta.

Previously, however, to this Spanish navigation of the Indian seas, by the way of South America, the expeditions of the Portuguese round the Cape of Good Hope, had rendered the island well known, both in regard to its local circumstances and the manners of its inhabitants. In a letter from Emanuel king of Portugal to Pope Leo the tenth, dated in 1513, he speaks of the discovery of *Zamatra* by his subjects; and the writings of Joano de Barros, Castanheda, Osorius, and Maffæus, detail the operations of Diogo Lopez *Sequeira* at *Pedir* and *Pasé* in 1509, and those of the great Affonso d'Alboquerque at the same places, in 1511, immediately before his attack upon Malacca. De Barros also enumerates the names of twenty of the principal places of the island with considerable precision, and observes, that the peninsula or *chersonesus* had the epithet of "*aurea*" given to it on account of the abundance of gold carried thither from *Monancabo* and *Barros*, countries in the island of Camatra. Portuguese expeditions. Emanuel king of Portugal.

Having thus noticed what has been written by persons who actually visited this part of India at an early period, or published from their oral communication by cotemporaries, it will not be thought necessary to multiply authorities by quoting the works of subsequent commenta-

tors and geographers, who must have formed their judgments from the same original materials.

Name of Sumatra.

With respect to the name of Sumatra, we perceive that it was unknown both to the Arabian travellers and to Marco Polo, who indeed was not likely to acquire it from the savage natives with whom he had intercourse. The appellation of *Java* minor, which he gives to the island, seems to have been quite arbitrary, and not grounded upon any authority, European or Oriental, unless we can suppose that he had determined it to be the Ἰαβαδίου νῆσος of Ptolemy; but from the other parts of his relation it does not appear that he was acquainted with the work of that great geographer, nor could he have used it with any practical advantage. At all events it could not have led him to the distinction of a greater and a lesser *Java*; and we may rather conclude, that having visited (or heard of) the great island properly so called, and not being able to learn the real name of another, which from its situation and size might well be regarded as a sister island, he applied the same to both, with the relative epithets of *major* and *minor*. That Ptolemy's *Jabadib* or *dio* was intended, however vaguely, for the island of *Java*, cannot be doubted. It must have been known to the Arabian merchants, and he was indefatigable in his inquiries; but at the same time that they communicated the name, they might be ill qualified to describe its geographical position.

In the rude narrative of Odoricus we perceive the first approach to the modern name in the word *Sumoltra*. Those who immediately followed him write it with a slight, and often inconsistent, variation in the orthography, *Sumotra*, *Samotra*, *Zamatra*, and *Sumatra*. But none of these travellers inform us from whom they learned it; whether from the natives or from persons who had been in the habits of frequenting it from the continent of India; which latter I think the more probable. Reland, an able oriental scholar, who directed his attention to the languages of the islands, says it obtains its appellation from a certain high land called *Samadra*, which he supposes to signify in the language of the country, a "large ant;" but in fact there is not any spot so named; and although there is some resemblance between *semut*, the word for an ant,

ant, and the name in question, the etymology is quite fanciful. Others have imagined that they find an easy derivation in the word *samatra*, to be met with in some Spanish or Portuguese dictionaries, as signifying a sudden storm of wind and rain, and from whence our seamen may have borrowed the expression; but it is evident that the order of derivation is here reversed, and that the phrase is taken from the name of the land in the neighbourhood of which such squalls prevail. In a Persian work of the year 1611, the name of *Shamatrah* occurs as one of those places where the Portuguese had established themselves; and in some very modern Malayan correspondence I find the word *Samantara* employed (along with another more usual, which will be hereafter mentioned) to designate this island. These, it is true, are not entirely free from the suspicion of having found their way to the Persians and Malays through the medium of European intercourse; but to a person who is conversant with the languages of the continent of India, it must be obvious that the name, however written, bears a strong resemblance to words in the Sanskrit language: nor should this appear extraordinary, when we consider (what is now fully admitted) that a large proportion of the Malayan is derived from that source, and that the names of many places in this and the neighbouring countries (such as *Indra-pura* and *Indra-giri* in Sumatra, *Siñga-pura* at the extremity of the peninsula, and *Suka-pura* and the mountain of *Maha-meru* in Java) are indisputably of Hindu origin. It is not my intention, however, to assign a precise etymology; but in order to shew the general analogy to known Sanskrit terms, it may be allowed to instance *Samuder*, the ancient name of the capital of the Carnatik, afterwards called *Bider*; *Samudra-duta*, which occurs in the *Hetopadesa*, as signifying the ambassador of the sea; the compound formed of *su*, good, and *matra*, measure; and more especially the word *samantara*, which implying "a boundary," "intermediate," or "what lies between," might be thought to apply to the peculiar situation of an island "intermediate" between two oceans and two straits.

Probably derived from the Sanskrit.

When on a former occasion it was asserted (and with too much confidence) that "the name of *Sumatra* is unknown to the natives, who are ignorant of its being an island, and have no general name for it," the

Not entirely unknown to the natives.

expression ought to have been confined to those natives with whom I had an opportunity of conversing, in the southern part of the west-coast, where much genuineness of manners prevails, with little of the spirit of commercial enterprise or communication with other countries. But even in situations more favourable for acquiring knowledge, I believe it will be found that the inhabitants of very large islands, and especially if surrounded by smaller ones, are accustomed to consider their own as *terra firma*, and to look to no other geographical distinction than that of the district or nation to which they belong. Accordingly we find that the more general names have commonly been given by foreigners, and as the Arabians chose to call this island *Al-Rami* or *Lameri*, so the Hindus appear to have named it *Sumatra* or *Samantara*.

Since that period, however, having become much better acquainted with Malayan literature, and perused the writings of various parts of the peninsula and islands where the language is spoken and cultivated, I am enabled to say that Sumatra is well known amongst the eastern people and the better-informed of the natives themselves, by the two names of *Indalas* and *Pulo Percha*, (or in the southern dialect, *Pritcho*). Of the meaning or analogies of the former, which seems to have been applied to it chiefly by the neighbouring people of *Java*, I have not any conjecture, and only observe its resemblance (doubtless accidental) to the Arabian denomination of Spain or Andalusia. In one passage I find the straits of Malacca termed the sea of *Indalas*, over which, we are gravely told, a bridge was thrown by Alexander the Great. The latter and more common name is from a Malayan word signifying "fragments" or "tatters," and the application is whimsically explained by the condition of the sails of the vessel in which the island was circumnavigated for the first time; but it may with more plausibility be supposed to allude to the broken or intersected land for which the eastern coast is so remarkable. It will indeed be seen in the map, that in the vicinity of what are called *Rupat*'s Straits, there is a particular place of this description named *Po. Percha*, or the Broken Islands. As to the appellation of *Po. Ber-api*, or Volcano Island, which has also occurred, it is too indefinite for a proper name, in a region of the globe where

Malayan names for the island.

Indalas.

Percha.

where the phænomenon is by no means rare or peculiar, and should rather be considered as a descriptive epithet.

In respect to magnitude, it ranks amongst the largest islands in the world; but its breadth throughout is determined with so little accuracy, that any attempt to calculate its superficies must be liable to very considerable error. Like Great Britain, it is broadest at the southern extremity, narrowing gradually to the north; and to this island it is perhaps in size more nearly allied than in shape. Magnitude.

A chain of mountains runs through its whole extent, the ranges being in many parts double and treble, but situated, in general, much nearer to the western than the opposite coast; being, on the former, seldom so much as twenty miles from the sea, whilst on the eastern side the extent of level country, in the broader part of the island, through which run the great rivers of *Siak*, *Indra-giri*, *Jambi*, and *Palembang*, cannot be less than an hundred and fifty. The height of these mountains, though very great, is not sufficient to occasion their being covered with snow, during any part of the year, as those in South America, between the tropics, are found to be. Mount *Ophir*, or *gunong Pasaman*, situated immediately under the equinoctial line, is supposed to be the highest visible from the sea; its summit being elevated thirteen thousand eight hundred and forty-two feet above that level; which is no more than two-thirds of the altitude the French astronomers have ascribed to the loftiest of the Andes, but somewhat exceeds that of the Peak of Teneriffe.* Between these Mountains.

* The following is the result of observations made by Mr. Robert Nairne, of the height of Mount Ophir.

Height of the peak above the level of the sea, in feet	13,842
English miles	2,6216
Nautical miles	2,26325
Inland, nearly	26 Naut. *miles.*
Distance from Massang Point	32 ditto.
Distance at sea before the peak is sunk under the horizon	125 ditto.
Latitude of the peak	0° 6 Minutes, north.
A volcano mountain, south of Ophir, is short of that in height by	1377 feet.

Inland,

these ridges of mountains, are extensive plains, considerably elevated above the surface of the maritime lands, where the air is cool; and from this advantage they are esteemed the most eligible portion of the country, are consequently the best inhabited, and the most cleared from woods, which elsewhere in general throughout Sumatra, cover both hills and vallies with an eternal shade. Here too are found many large and beautiful lakes that extend, at intervals, through the heart of the country, and facilitate much the communication between the different parts; but their dimensions, situation, or direction, are very little known, though the natives make frequent mention of them in the accounts of their journeys. Those principally spoken of are, one of great extent, but unascertained situation, in the *Batta* country; one in the *Korinchi* country, lately visited by Mr. C. Campbel; and another in the *Lampong* country, extending towards *Pasummah*, navigated by boats of a large class, with sails, and requires a day and night to effect the passage across it; which may be the case in the rainy season, as that part of the island, through which the *Tulang Bawang* river flows, is subject to extensive inundations, causing it to communicate with the river of the *Palembang*. In a journey made many years since by a son of the Sultan of the latter place, to visit the English resident at Croee, he is said to have proceeded by the way of that lake. It is much to be regretted, that the situation of so important a feature in the geography of the island should be at this day the subject of uncertain conjecture.

Waterfalls. Waterfalls and cascades are not uncommon, as may be supposed, in a country of so uneven a surface as that of the western coast. A remarkable

Inland, nearly - - - - - - - - - - - - - - - - - 29 Naut. miles.

In order to form a comparison, I subjoin the height, as computed by mathematicians, of other mountains in different parts of the world.

Chimborazo, the highest of the Andes, 3220 toises, or 20,633 English feet. Of this about 2400 feet from the summit are covered with eternal snow.

Carazon, ascended by the French astronomers, - - - -	15,800 English feet.
Peak of Teneriffe. Feuillé - 2270 toises, or - - - -	13,265 feet.
Mount Blanc, Savoy. Sr. G. Shuckburgh - - - - -	15,662
Mount Ætna. Ditto - - - - - - - -	10,954

remarkable one descends from the north-side of Mount *Pugong*. The island of *Mansalar* lying off, and affording shelter to the bay of *Tappanuli*, presents to the view a fall of very striking appearance, the reservoir of which the natives assert (in their fondness for the marvellous) to be a huge shell of the species called *Kima* (chama gigas), found in great quantities in that bay, as well as at New Guinea and other parts of the east.* At the bottom of this fall ships occasionally take in their water, without being under the necessity of landing their casks; but such attempts are liable to extreme hazard. A ship from England (the Elgin) attracted by the appearance from sea of a small but beautiful cascade descending perpendicularly from the steep cliff, that, like an immense rampart, lines the sea-shore near *Manna*, sent a boat in order to procure fresh water; but she was lost in the surf, and the crew drowned.

No country in the world is better supplied with water than the western coast of the island. Springs are found wherever they are sought for, and the rivers are innumerable; but they are in general too small and rapid for the purpose of navigation. The vicinity of the mountains to that side of the island occasions this profusion of rivulets, and at the same time the imperfections that attend them, by not allowing them space to accumulate to any considerable size. On the eastern coast, the distance of the range of hills not only affords a larger scope for the course of the rivers before they disembogue, presents a greater surface for the receptacle of rain and vapours, and enables them to unite a greater number of subsidiary streams, but also renders the flux more steady and uniform by the extent of level space, than where the torrent rolls more immediately from the mountains. But it is not to be understood that on the western side there are no large rivers. *Kataun, Indrapura, Tabuyong,* Rivers.

* The largest I have seen was brought from Tappanuli by Mr. James Moore, of Arno's Vale, in the north of Ireland. It is 3ft. 3½inch. in its longest diameter, and 2ft. 1¼inch. across. One of the methods of taking them, in deep water, is by thrusting a long bamboo between the valves as they lie open, when by the immediate closure which follows, they are made fast. The substance of the shell is perfectly white, several inches thick, is worked by the natives into arm-rings, and in the hands of our artists is found to take a polish equal to the finest statuary marble.

Tabuyong, and *Sinkel*, have a claim to that title, although inferior in size to *Palembang*, *Jambi*, *Indragiri*, and *Siak*. The latter derive also a material advantage from the shelter given to them by the peninsula of *Malacca*, and *Borneo*, *Banca*, and the other islands of the Archipelago, which, breaking the force of the sea, prevent the surf from forming those bars that choke the entrance of the south-western rivers, and render them impracticable to boats of any considerable draught of water. These labour too under this additional inconvenience, that scarcely any, except the largest, run out to sea in a direct course. The continual action of the surf, more powerful than the ordinary force of the stream, throws up at their mouths a bank of sand, which, in many instances, has the effect of diverting their course to a direction parallel with the shore, between the cliffs and the beach, until the accumulated waters at length force their way wherever there is found the weakest resistance. In the southerly Monsoon, when the surfs are usually highest, and the streams, from the dryness of the weather, least rapid, this parallel course is of the greatest extent; and *Moco-moco* river takes a course, at times, of two or three miles, in this manner, before it mixes with the sea; but as the rivers swell with the rain, they gradually remove obstructions and recover their natural channel.

Air. The heat of the air is by no means so intense as might be expected, in a country occupying the middle of the torrid zone. It is more temperate than in many regions without the tropics, the thermometer, at the most sultry hour, which is about two in the afternoon, generally fluctuating between 82 and 85 degrees. I do not recollect to have ever seen it higher than 86 in the shade, at Fort Marlborough; although at Natal, in lat. 34′ N. it is not unfrequently at 87° and 88°. At sun-rise it is usually as low as 70; the sensation of cold, however, is much greater than this would seem to indicate, as it occasions shivering and a chattering of the teeth; doubtless from the greater relaxation of the body and openness of the pores in that climate; for the same temperature in England would be esteemed a considerable degree of warmth. These observations on the state of the air apply only to the districts near the sea-coast, where, from their comparatively low situation, and the greater compression of the atmosphere, the sun's rays operate more powerfully.

Inland,

Inland, as the country ascends, the degree of heat decreases rapidly, insomuch, that beyond the first range of hills, the inhabitants find it expedient to light fires in the morning, and continue them till the day is advanced, for the purpose of warming themselves; a practice unknown in the other parts of the island; and in the journal of Lieut. Dare's expedition it appears, that during one night's halt on the summit of a mountain, in the rainy season, he lost several of his party from the severity of the weather, whilst the thermometer was not lower than 40°. To the cold also they attribute the backwardness in growth of the cocoa-nut tree, which is sometimes twenty or thirty years in coming to perfection, and often fails to produce fruit. Situations are uniformly colder in proportion to their height above the level of the sea, unless where local circumstances, such as the neighbourhood of sandy plains, contribute to produce a contrary effect; but in Sumatra the coolness of the air is promoted by the quality of the soil, which is clayey, and the constant and strong verdure that prevails, which, by absorbing the sun's rays, prevents the effect of their reflection. The circumstance of the island being so narrow contributes also to its general temperateness, as wind directly or recently from the sea is seldom possessed of any violent degree of heat, usually acquired in passing over large tracts of land in the tropical climates. Frost, snow, and hail, I believe to be unknown to the inhabitants. The hill-people in the country of Lampong speak, indeed, of a peculiar kind of rain that falls there, which some have supposed to be what we call sleet; but the fact is not sufficiently established. The atmosphere is in common more cloudy than in Europe, which is sensibly perceived, from the infrequency of clear star-light nights. This may proceed from the greater rarefaction of the air occasioning the clouds to descend lower and become more opaque, or merely from the stronger heat exhaling from the land and sea a thicker and more plentiful vapour. The fog, called *Kabūt* by the natives, which is observed to rise every morning among the distant hills, is dense to a surprising degree; the extremities of it, even when near at hand, being perfectly defined; and it seldom is observed to disperse till about three hours after sun-rise.

That extraordinary phænomenon, the waterspout, so well known to Waterspout.

and described by navigators, frequently makes its appearance in these parts, and occasionally on shore. I had seen many at sea; but the largest and most distinct (from its proximity) that I had an opportunity of observing, presented itself to me whilst on horseback. I was so near to it, that I could perceive what appeared to be an inward gyration, distinct from the volume surrounding it or body of the tube; but am aware that this might have been a deception of sight, and that it was the exterior part which actually revolved—as quiescent bodies seem to persons in quick motion, to recede in a contrary direction. Like other waterspouts, it was sometimes perpendicular and sometimes curved, like the pipe of a still-head; its course tending in a direction from Bencoolen Bay across the peninsula on which the English settlement stands; but before it reached the sea on the other side, it diminished by degrees, as if from want of the supplies that should be furnished by its proper element, and collected itself into the cloud from which it depended, without any consequent fall of water or destructive effect. The whole operation we may presume to be of the nature of a whirlwind, and the violent ebullition in that part of the sea to which the lower extremity of the tube points, to be a corresponding effect to the agitation of the leaves or sand on shore, which in some instances are raised to a vast height; but in the formation of the waterspout the rotatory motion of the wind acts not only upon the surface of the land or sea, but also upon the overhanging cloud, and seems to draw it downwards.

Thunder and lightning.

Thunder and lightning are there so very frequent, as scarcely to attract the attention of persons long resident in the country. During the north-west monsoon, the explosions are extremely violent; the forked lightning shoots in all directions, and the whole sky seems on fire; whilst the ground is agitated in a degree, little inferior to the motion of a slight earthquake. In the south-east monsoon, the lightning is more constant, but the coruscations are less fierce or bright, and the thunder is scarcely audible. It would seem that the consequences of these awful meteors are not so fatal there as in Europe; few instances occurring of lives being lost, or buildings destroyed by the explosions, although electrical conductors have never been employed. Perhaps the paucity of inhabitants, in proportion to the extent of country, and the unsubstantial materials

materials of the houses, may contribute to this observation. I have seen some trees, however, that have been shattered in Sumatra by the action of lightning.*

The causes which produce a successive variety of seasons in the parts of the earth without the tropics, having no relation or respect to the region of the torrid zone, a different order takes place there, and the year is distinguished into two divisions, usually called the rainy and dry monsoons or seasons, from the weather peculiar to each. In the several parts of India these monsoons are governed by various particular laws, in regard to the time of their commencement, period of duration, circumstances attending their change, and direction of the prevailing wind according to the nature and situation of the lands and coasts where their influence is felt. The farther peninsula of India, where the kingdom of Siam lies, experiences at the same time the effects of opposite seasons; the wetern side, in the bay of Bengal, being exposed for half the year to continual rains, whilst on the eastern side the finest weather is enjoyed; and so on the different coasts of Indostan, the monsoons exert their influence alternately; the one remaining serene and undisturbed, whilst the other is agitated by storms. Along the coast of Coromandel, the change, or breaking up of the monsoon, as it is called, is frequently attended with the most violent gales of wind. Monsoons.

On the west coast of Sumatra, southward of the equinoctial, the SE. monsoon, or dry season, begins about May, and slackens in September: the NW. monsoon begins about November, and the hard rains cease about March. The monsoons for the most part commence and leave off gradually there; the months of April and May, October and November, generally affording weather and winds variable and uncertain.

The causes of these periodical winds have been investigated by several able Cause of the monsoons.

*Since the above was written, accounts have been received that a magazine, at Fort Marlborough, containing four hundred barrels of powder, was fired by lightning, and blown up, on the 18th of March, 1782.

able naturalists, whose systems, however, do not entirely correspond either in the principles laid down, or in their application to the effects known to be produced in different parts of the globe. I shall summarily mention what appear to me the most evident, or probable at least, among the general laws, or inferences, which have been deduced from the examination of this subject. If the sea were perfectly uninterrupted, and free from the irregular influence of lands, a perpetual easterly wind would prevail in all that space comprehended between the twenty-eighth or thirtieth degrees of north and south latitude. This is primarily occasioned by the diurnal revolution of the earth upon its axis from west to east; but whether through the operation of the sun, proceeding westward, upon the atmospheric fluid, or the rapidity of revolution of the solid body, which leaves behind it that fluid with which it is surrounded, and thereby causes it virtually to recede in a contrary direction; or whether these principles co-operate, or unequally oppose each other, as has been ingeniously contended, I shall not take upon me to decide. It is sufficient to say, that such an effect appears to be the first general law of the tropical winds. Whatever may be the degree of the sun's influence upon the atmosphere, in his transient diurnal course, it cannot be doubted but that in regard to his station in the path of the ecliptic, his power is considerable. Towards that region of the air which is rarefied by the more immediate presence of the heat, the colder and denser parts will naturally flow. Consequently from about, and a few degrees beyond, the tropics, on either side, the air tends towards the equator; and combining with the general eastern current before-mentioned, produces (or would, if the surface were uniform) a NE. wind in the northern division, and a SE. in the southern; varying in the extent of its course, as the sun happens to be more or less remote at the time. These are denominated the trade-winds, and are the subject of the second general observation. It is evident that with respect to the middle space between the tropics, those parts which at one season of the year lie to the northward of the sun, are, during another, to the southward of him; and of course, that an alteration of the effects last described must take place, according to the relative situation of the luminary; or, in other words, that the principle which causes at one time a NE. wind to prevail at any particular spot in those latitudes, must, when the circumstances are changed,

changed, occasion a SE. wind. Such may be esteemed the outline of the periodical winds, which undoubtedly depend upon the alternate course of the sun, northwards and southwards; and this I state as the third general law. But although this may be conformable with experience in extensive oceans, yet in the vicinity of continents, and great islands, deviations are remarked that almost seem to overturn the principle. Along the western coast of Africa, and in some parts of the Indian seas, the periodical winds, or monsoons, as they are termed in the latter, blow from the WNW. and SW. according to the situation, extent, and nature of the nearest lands; the effect of which upon the incumbent atmosphere, when heated by the sun, at those seasons in which he is vertical, is prodigious, and possibly superior to that of any other cause which contributes to the production or direction of wind. To trace the operation of this irregular principle through the several winds prevalent in India, and their periodical failures and changes, would prove an intricate, but I conceive by no means an impossible task.[a] It is foreign, however, to my present purpose, and I shall only observe, that the NE. monsoon is changed, on the western coast of Sumatra, to NW. or WNW. by the influence of the land. During the SE. monsoon, the wind is found to blow there, between that point and south. Whilst the sun continues near the equator, the winds are variable, nor is their direction fixed till he has advanced several degrees towards the tropic: and this is the cause of the monsoons usually setting in, as I have observed, about May and November, instead of the equinoctial months.

Land and sea breezes.

Thus much is sufficient with regard to the periodical winds. I shall proceed to give an account of those distinguished by the appellation of land and sea breezes, which require from me a minuter investigation, both because, as being more local, they more especially belong to my subject, and that their nature has hitherto been less particularly treated of by naturalists.

In

[a] It has been attempted, and with much ingenious reasoning, by Mr. Semeyns, in the third vol. of the Haerlem Transactions, which have but lately fallen into my hands.

In this island, as well as all other countries between the tropics, of any considerable extent, the wind uniformly blows from the sea to the land, for a certain number of hours in the four and twenty, and then changes, and blows for about as many from the land to the sea; excepting only when the monsoon rages with remarkable violence, and even at such time the wind rarely fails to incline a few points, in compliance with the efforts of the subordinate cause, which has not power, under these circumstances, to produce an entire change. On the west coast of Sumatra, the sea-breeze usually sets in, after an hour or two of calm, about ten in the forenoon, and continues till near six in the evening. About seven the land-breeze comes off, and prevails through the night till towards eight in the morning, when it gradually dies away.

Cause of the land and sea breezes.

These depend upon the same general principle that causes and regulates all other wind. Heat acting upon air, rarefies it, by which it becomes specifically lighter, and mounts upward. The denser parts of the atmosphere, which surround that so rarefied, rush into the vacuity from their superior weight; endeavouring, as the laws of gravity require, to restore the equilibrium. Thus in the round buildings where the manufactory of glass is carried on, the heat of the furnace in the centre being intense, a violent current of air may be perceived to force its way in, through doors or crevices, on opposite sides of the house. As the general winds are caused by the *direct* influence of the sun's rays upon the atmosphere, that particular deviation of the current distinguished by the name of land and sea breezes, is caused by the influence of his *reflected* rays, returned from the earth or sea on which they strike. The surface of the earth is more suddenly heated by the rays of the sun, than that of the sea, from its greater density and state of rest; consequently it reflects those rays sooner and with more power: but owing also to its density, the heat is more superficial than that imbibed by the sea, which becomes more intimately warmed, by its transparency, and by its motion, continually presenting a fresh surface to the sun. I shall now endeavour to apply these principles. By the time the rising sun has ascended to the height of thirty or forty degrees above the horizon, the earth has acquired, and reflected on the body of air situated

over

over it, a degree of heat sufficient to rarefy it and destroy its equilibrium; in consequence of which, the body of air above the sea, not being equally, or scarcely at all rarefied, rushes towards the land; and the same causes operating so long as the sun continues above the horizon, a constant sea-breeze, or current of air from sea to land, prevails during that time. From about an hour before sun-set, the surface of the earth begins to lose the heat it has acquired from the more perpendicular rays. That influence of course ceases, and a calm succeeds. The warmth imparted to the sea, not so violent as that of the land, but more deeply imbibed, and consequently more permanent, now acts in turn, and by the rarefaction it causes, draws towards its region the land air, grown cooler, more dense, and heavier, which continues thus to flow back, till the earth, by a renovation of its heat in the morning, once more obtains the ascendency. Such is the general rule, conformable with experience, and founded, as it seems to me, in the laws of motion, and the nature of things. The following observations will serve to corroborate what I have advanced, and to throw additional light on the subject, for the information and guidance of any future investigator.

The periodical winds which are supposed to blow during six months from the NW. and as many from the SE. rarely observe this regularity, except in the very heart of the monsoon; inclining, almost at all times, several points to seaward, and not unfrequently blowing from the SW. or in a line perpendicular to the coast. This must be attributed to the influence of that principle which causes the land and sea winds proving on these occasions more powerful than the principle of the periodical winds; which two seem here to act at right angles with each other; and as the influence of either is prevalent, the winds draw towards a course perpendicular to, or parallel with the line of the coast. Excepting when a squall, or other sudden alteration of weather, to which these climates are particularly liable, produces an irregularity, the tendency of the land-wind at night has almost ever a correspondence with the sea-wind of the preceding or following day; not blowing in a direction immediately opposite to it (which would be the case, if the former were, as some writers have supposed, merely the effect of the accumulation

lation and redundance of the latter, without any positive cause), but forming an equal and contiguous angle, of which the coast is the common side. Thus, if the coast be conceived to run N. and S., the same influence, or combination of influences, which produces a sea-wind at NW. produces a land-wind at NE.; or adapting the case to Sumatra, which lies NW. and SE., a sea-wind at S. is preceded or followed by a land-wind at E. This remark must not be taken in too strict a sense, but only as the result of general observation. If the land-wind, in the course of the night, should draw round from E. to N. it would be looked upon as an infallible prognostic of a W. or NW. wind the next day. On this principle it is that the natives foretel the direction of the wind by the noise of the surf at night, which if heard from the northward, is esteemed the forerunner of a northerly wind, and *vice versâ*. The quarter from which the noise is heard depends upon the course of the land-wind, which brings the sound with it, and drowns it to leeward—the land-wind has a correspondence with the next day's sea-wind—and thus the divination is accounted for.

The effect of the sea-wind is not perceived to the distance of more than three or four leagues from the shore in common, and for the most part it is fainter in proportion to the distance. When it first sets in, it does not commence at the remoter extremity of its limits, but very near the shore, and gradually extends itself farther to sea, as the day advances; probably taking the longer or shorter course as the day is more or less hot. I have frequently observed the sails of ships, at the distance of four, six, or eight miles, quite becalmed, whilst a fresh sea-breeze was at the time blowing upon the shore. In an hour afterwards they have felt its effect.*

Passing along the beach about six o'clock in the evening, when the sea-breeze is making its final efforts, I have perceived it to blow with a considerable

* This observation, as well as many others I have made on the subject, I find corroborated in the Treatise before quoted from the Haerlem Transactions, which I had not seen when the present work was first published.

considerable degree of warmth, owing to the heat the sea had by that time acquired, which would soon begin to divert the current of air towards it, when it had first overcome the *vis inertiæ* that preserves motion in a body after the impelling power has ceased to operate. I have likewise been sensible of a degree of warmth on passing, within two hours after sun-set, to leeward of a lake of fresh water; which proves the assertion of water imbibing a more permanent heat than earth. In the day-time the breeze would be rendered cool in crossing the same lake.

Approaching an island situated at a distance from any other land, I was struck with the appearance of the clouds about nine in the morning, which then formed a perfect circle round it, the middle being a clear azure, and resembled what the painters call a glory. This I account for from the reflected rays of the sun rarefying the atmosphere immediately over the island, and equally in all parts, which caused a conflux of the neighbouring air, and with it the circumjacent clouds. These last, tending uniformly to the centre, compressed each other at a certain distance from it, and, like the stones in an arch of masonry, prevented each other's nearer approach. That island, however, does not experience the vicissitude of land and sea breezes, being too small, and too lofty, and situated in a latitude where the trade or perpetual winds prevail in their utmost force. In sandy countries the effect of the sun's rays penetrating deeply, a more permanent heat is produced, the consequence of which should be, the longer continuance of the sea-breeze in the evening; and agreeably to this supposition I have been informed, that on the coast of Coromandel it seldom dies away before ten at night. I shall only add on this subject, that the land-wind on Sumatra is cold, chilly, and damp; an exposure to it is therefore dangerous to the health, and sleeping in it almost certain death.

Soil.

The soil of the western side of Sumatra may be spoken of generally as a stiff, reddish clay, covered with a stratum or layer of black mould, of no considerable depth. From this there springs a strong and perpetual verdure, of rank grass, brush wood, or timber trees, according as the country has remained a longer or shorter time undisturbed by the consequences of population, which being in most places extremely thin, it

follows that a great proportion of the island, and especially to the southward, is an impervious forest.

Unevenness of surface.

Along the western coast of the island, the low country, or space of land which extends from the sea-shore to the foot of the mountains, is intersected and rendered uneven to a surprising degree by swamps, whose irregular and winding course may in some places be traced in a continual chain for many miles, till they discharge themselves either into the sea, some neighbouring lake, or the fens that are so commonly found near the banks of the larger rivers, and receive their overflowings in the rainy monsoons. The spots of land which these swamps encompass become so many islands and peninsulas, sometimes flat at top, and often mere ridges; having in some places a gentle declivity, and in others descending almost perpendicularly to the depth of an hundred feet. In few parts of the country of Bencoolen, or of the northern districts adjacent to it, could a tolerably level space of four hundred yards square be marked out. I have often, from an elevated situation, where a wider range was subjected to the eye, surveyed with admiration the uncommon face which nature assumes, and made inquiries and attended to conjectures on the causes of these inequalities. Some chuse to attribute them to the successive concussions of earthquakes, through a course of centuries. But they do not seem to be the effect of such a cause. There are no abrupt fissures; the hollows and swellings are for the most part smooth and regularly slooping, so as to exhibit not unfrequently the appearance of an amphitheatre, and they are clothed with verdure from the summit to the edge of the swamp. From this latter circumstance it is also evident that they are not, as others suppose, occasioned by the falls of heavy rains that deluge the country for one half of the year; which is likewise to be inferred from many of them having no apparent outlet, and commencing where no torrent could be conceived to operate. The most summary way of accounting for this extraordinary unevenness of surface were to conclude, that in the original construction of our globe, Sumatra was thus formed by the same hand which spread out the sandy plains of Arabia, and raised up the Alps and Andes beyond the region of the clouds. But this is a mode of solution, which, if generally adopted, would become an insuperable bar to all progress in natural knowledge, by

by damping curiosity and restraining research. Nature, we know from sufficient experience, is not only turned from her original course by the industry of man, but also sometimes checks and crosses her own career. What has happened in some instances, it is not unfair to suppose may happen in others; nor is it presumption to trace the intermediate causes of events, which are themselves derived from one first, universal, and eternal principle. To me it would seem, that the springs of water with which these parts of the island abound in an uncommon degree, operate directly, though obscurely, to the producing this irregularity of the surface of the earth. They derive their number, and an extraordinary portion of activity, from the loftiness of the ranges of mountains that occupy the interior country, and intercept and collect the floating vapours. Precipitated into rain at such a height, the water acquires in its descent through the fissures or pores of these mountains, a considerable force, which exerts itself in every direction, lateral and perpendicular, to procure a vent. The existence of these copious springs is proved, in the facility with which wells are every where sunk; requiring no choice of ground, but as it may respect the convenience of the proprietor; all situations, whether high or low, being prodigal of this valuable element. Where the approaches of the sea have rendered the cliffs abrupt, innumerable rills, or rather a continued moisture is seen to ooze through, and trickle down the steep. Where, on the contrary, the sea has retired and thrown up banks of sand in its retreat, I have remarked the streams of water, at a certain level, and commonly between the boundaries of the tide, effecting their passage through the loose and feeble barrier opposed to them. In short, every part of the low country is pregnant with springs that labour for the birth, and these continual struggles, this violent activity of subterraneous waters, must gradually undermine the plains above. The earth is imperceptibly excavated, the surface settles in, and hence the inequalities we speak of. The operation is slow, but unremitting, and, I conceive, fully capable of the effect.

Causes of this inequality.

The earth of Sumatra is rich in minerals and other fossil productions. No country has been more famous in all ages for gold, and though the sources from whence it is drawn may be supposed in some measure exhausted, by the avarice and industry of ages, yet at this day the quantity

Mineral productions. Gold.

tity procured is very considerable, and doubtless might be much increased, were the simple labour of the gatherer assisted by a knowledge of the arts of mineralogy. There are also mines of copper, iron, and tin. Sulphur is gathered in large quantities about the numerous volcanos. Saltpetre the natives procure, by a process of their own, from the earth which is found impregnated with it; chiefly in extensive caves that have been, from the beginning of time, the haunt of a certain species of birds, of whose dung the soil is formed. Coal, mostly washed down by the floods, is collected in several parts, particularly at Kattaun, Ayer-rammi, and Bencoolen. It is light, and not esteemed very good; but I am informed that this is the case with all coal found near the surface of the earth, and as the veins are observed to run in an inclined direction, until the pits have some depth, the fossil must be of an indifferent quality. The little island of *Pisang*, near the foot of Mount *Pugong*, was supposed to be chiefly a bed of rock crystal, but upon examination of specimens taken from thence, they proved to be calcareous spar. Mineral and hot springs have been discovered in many districts. In taste the waters mostly resemble those of Harrowgate, being nauseous to the palate. The oleum terræ, or earth oil, used chiefly as a preservative against the destructive ravages of the white ants, is collected at *Ipu* and elsewhere.[a] There is scarcely any species of hard rock to be met with in the low parts of the island, near the sea-shore. Besides the ledges of coral, which are covered by the tide, that which generally prevails is the *napal*, as it is called by the inhabitants, forming the basis of the red cliffs, and not unfrequently the beds of the rivers. Though this napal has the appearance of rock, it possesses in fact so little solidity, that it is difficult to pronounce whether it be a soft stone or only an indurated clay. The surface of it becomes smooth and glossy by a slight attrition, and to the touch resembles soap, which is its most striking characteristic; but it is not soluble in water, and makes no effervescence with acids. Its colour is either grey, brown, or red, according to the nature of the earth that prevails in its composition. The red napal has by much the smallest proportion of sand, and seems to possess all the qualities of the steatite

Copper. Iron. Tin. Sulphur.

Saltpetre.

Coal.

Hot springs.

Earth oil.

Soft rock.

[a] The fountain of Naphtha or liquid balsam, found at *Pedir*, so much celebrated by the Portuguese writers, is doubtless this oleum terræ, or *meniak tanah*, as it is called by the Malays.

steatite or soap earth, found in Cornwall and other countries. The specimens of stone which I brought from the hills in the neighbourhood of Bencoolen, were pronounced, by some mineralogists to whom I shewed them at the time, to be Granite; but upon more particular examination they appear to be a species of Trap, consisting principally of Feldtspar and Hornblend, of a greyish colour, and nearly similar to the mountain stone of North Wales.

Where the encroachments of the sea have undermined the land, the cliffs are left abrupt and naked, in some places to a very considerable height. In these many curious fossils are discovered, such as petrified wood, and sea-shells of various sorts. Hypotheses on this subject have been so ably supported and so powerfully attacked, that I shall not presume to intrude myself in the lists. I shall only observe, that being so near the sea, many would hesitate to allow such discoveries to be of any weight in proving a violent alteration to have taken place in the surface of the terraqueous globe; whilst, on the other hand, it is unaccountable how, in the common course of natural events, such extraneous matter should come to be lodged in strata, at the height, perhaps, of fifty feet above the level of the water, and as many below the surface of the land. Here are likewise found various species of earths, which might be applied to valuable purposes, as painters' colours, and otherwise. The most common are the yellow and red, probably ochres, and the white, which answers the description of the *milenum* of the ancients.

Petrifaction.

Coloured earths.

There are a number of volcano mountains in this, as in almost all the other islands of the eastern Archipelago. They are called in the Malay language *gunong-api*, or, more correctly, *gunong ber-api*. Lava has been seen to flow from a considerable one near *Priamang*; but I have never heard of its causing any other damage than the burning of woods. This, however, may be owing to the thinness of population, which does not render it necessary for the inhabitants to settle in a situation that exposes them to danger of this kind. The only volcano I had an opportunity of observing, opened in the side of a mountain, about twenty miles inland of Bencoolen, one-fourth way from its top, as nearly as I can judge. It scarcely ever failed to emit smoke; but the column was only visible

Volcanos.

visible for two or three hours in the morning, seldom rising and preserving its form, above the upper edge of the hill, which is not of a conical shape, but extending with a gradual slope. The high trees with which the country thereabout is covered, prevent the crater from being discernible at a distance; and this proves, that the spot is not considerably raised or otherwise affected by the eruptions. I could never perceive that it had any connection with the earthquakes, which are very frequently felt there. Sometimes it has emitted smoke upon these occasions, and in other instances, not. Yet, during a smart earthquake which happened a few years before my arrival, it was remarked to send forth flame, which it is rarely known to do.[a] The apprehension of the European inhabitants, however, is rather more excited, when it continues any length of time without a tendency to an eruption, as they conceive it to be the vent by which the inflammable matter escapes, that would otherwise produce these commotions of the earth. Comparatively with the descriptions I have read of earthquakes in South America, Calabria, and other countries, those which happen in Sumatra, are generally very slight; and the usual manner of building, renders them but little formidable to the natives. The most severe that I have known, was chiefly experienced in the district of *Manna*, in the year 1770. A village was destroyed by the houses falling down and taking fire, and several lives were lost.[b] The ground was in one place rent a quarter of a mile, the width of two fathoms, and depth of four or five. A bituminous matter is described to have swelled over the sides of the cavity, and the earth, for a long time after the shocks, was observed to contract and dilate alternately. Many parts of the hills far inland could be distinguished to have given way, and a consequence of this was, that during three weeks, *Manna* River was so much impregnated with particles of clay, that the natives could not bathe in it. At this time was

Earthquakes.

Remarkable effects of an earthquake.

[a] Some gentlemen, who deny the fact of its having at any time emitted flame, conjecture, that what exhibits the appearance of smoke, is more probably vapour, arising from a considerable hot spring. The natives speak of it as a volcano.

[b] I am informed that in 1763, an entire village was swallowed up by an earthquake in *Poolo Nias*, one of the islands which lie off the western coast of Sumatra. In July or August of the same year, a severe one was felt in *Bengal*.

was formed near to the mouth of *Padang Guchi*, a neighbouring river, south of the former, a large plain, seven miles long and half a mile broad; where there had been before only a narrow beach. The quantity of earth brought down on this occasion was so considerable, that the hill upon which the English resident's house stands, appears, from indubitable marks, less elevated by fifteen feet than it was before the event. Earthquakes have been remarked by some to happen usually upon sudden changes of weather, and particularly after violent heats; but I do not vouch this upon my own experience, which has been pretty ample. They are preceded by a low rumbling noise like distant thunder. The domestic cattle and fowls are sensible of the preternatural motion, and seem much alarmed; the latter making the cry they are wont to do on the approach of birds of prey. Houses situated on a low sandy soil are least affected, and those which stand on distinct hills, suffer most from the shocks, because the further removed from the centre of motion, the greater the agitation; and the loose contexture of the one foundation, making less resistance than the solidity of the other, subjects the building to less violence. Ships at anchor in the road, though several miles distant from the shore, are strongly sensible of the concussion.

New land formed.

Besides the new land formed by the convulsions above described, the sea by a gradual recess in some parts, produces the same effect. Many instances of this kind, of no considerable extent, however, have been observed within the memory of persons now living. But it would seem to me, that that large tract of land, called *Pulo Point*, forming the bay of the name, near to *Silebar*; with much of the adjacent country, has thus been left by the withdrawing, or thrown up by the motion of the sea. Perhaps the point may have been at first an island (from whence its appellation of *Pulo*) and the parts more inland, gradually united to it.* Various circumstances tend to corroborate such an opinion, and to evince the probability that this was not an original portion of the main, but new, half-formed land. All the swamps and marshy grounds that lie

* Since I formed this conjecture, I have been told that such a tradition, of no very ancient date, prevails amongst the inhabitants.

lie within the beach, and near the extremity there are little else, are known, in consequence of repeated surveys, to be lower than the level of high water; the bank of sand alone preventing an inundation. The country is not only quite free from hills or inequalities of any kind, but has scarcely a visible slope. *Silebar* River, which empties itself into *Pulo* Bay, is totally unlike those in other parts of the island. The motion of its stream is hardly perceptible; it is never affected by floods; its course is marked out, not by banks covered with ancient and venerable woods, but by rows of mangroves and other aquatics, springing from the ooze, and perfectly regular. Some miles from the mouth, it opens into a beautiful and extensive lake, diversified with small islands, flat, and verdant with rushes only. The point of *Pulo* is covered with the *Arau* tree (casuarina) or bastard pine, as some have called it, which never grows but in the sea-sand, and rises fast.* None such are found toward *Sungei-lamo* and the rest of the shore northward of Marlborough Point, where, on the contrary, you perceive the effects of continual depredations by the ocean. The old forest trees are there yearly undermined, and falling, obstruct the traveller; whilst about *Pulo*, the *Arau* trees are continually springing up, faster than they can be cut down or otherwise destroyed. Nature will not readily be forced from her course. The last time I visited that part, there was a beautiful rising grove of these trees, establishing a possession in their proper soil. The country, as well immediately hereabout, as to a considerable distance inland, is an entire bed of sand, without any mixture of clay or mould, which I know to have been in vain sought for, many miles up the neighbouring rivers. To the northward of *Padang* there is a plain, which has evidently been, in former times, a bay. Traces of a shelving beach are there distinguishable at the distance of one hundred and fifty yards from the present boundary of the sea.

Encroachment of the sea.

But upon what hypothesis can it be accounted for, that the sea should commit depredations on the northern coast, of which there are the most evident tokens, as high up at least as *Ipu*, and probably to *Indrapura*, where the shelter of the neighbouring islands may put a stop to them, and that it should restore the land to the southward, in the manner I have described? I am aware that according to the general motion of the

the tides from east to west, this coast ought to receive a continual accession, proportioned to the loss which others, exposed to the direction of this motion, must and do sustain; and it is likely that it does gain upon the whole. But the nature of my work obliges me to be more attentive to effects than causes, and to record facts, though they should clash with systems the most just in theory, and most respectable in point of authority.

Islands near the west coast.

The chain of islands which lie parallel with the west coast of Sumatra, may probably have once formed a part of the main, and been separated from it, either by some violent effort of nature, or the gradual attrition of the sea. I should scarcely introduce the mention of this apparently vague surmise, but that a circumstance presents itself on the coast, which affords some stronger colour of proof than can be usually obtained in such instances. In many places, and particularly about *Pally*, we observe detached pieces of land standing singly, as islands, at the distance of one or two hundred yards from the shore, which were head-lands of points running out into the sea, within the remembrance of the inhabitants. The tops continue covered with trees or shrubs; but the sides are bare, abrupt, and perpendicular. The progress of insulation here is obvious and incontrovertible, and why may not larger islands, at a greater distance, have been formed, in the revolution of ages, by the same accidents? The probability is heightened by the direction of the islands, *Nias*, *Batu*, *Mantawei*, *Pagi*, *Mego*, &c. the similarity of rock, soil, and productions, and the regularity of soundings between them and the main, whilst without them the depth is unfathomable.

Coral rocks.

Where the shore is flat or shelving, the coast of Sumatra, as of all other tropical islands, is defended from the attacks of the sea by a reef or ledge of coral rock, on which the surfs exert their violence without further effect than that of keeping its surface even, and reducing to powder those beautiful excrescences and ramifications which have been so much the object of the naturalist's curiosity, and which some ingenious men, who have analysed them, contend to be the work of insects. The coral powder is in particular places accumulated on the shore in

great quantities, and appears, when not closely inspected, like a fine white sand.

Surf. The surf (a word not to be found, I believe, in our dictionaries) is used in India, and by navigators in general, to express a peculiar swell and breaking of the sea upon the shore; the phænomena of which not having been hitherto much adverted to by writers, I shall be the more circumstantial in my description of them.

The surf forms sometimes but a single range along the shore. At other times there is a succession of two, three, four, or more, behind each other, extending perhaps half a mile out to sea. The number of ranges is generally in proportion to the height and violence of the surf.

The surf begins to assume its form at some distance from the place where it breaks, gradually accumulating as it moves forward, till it gains a height, in common, of fifteen to twenty feet,* when it overhangs at top, and falls, like a cascade, nearly perpendicular, involving itself as it descends. The noise made by the fall is prodigious, and, during the stillness of the night, may be heard many miles up the country.

Though in the rising and formation of the surf, the water seems to have a quick progressive motion towards the land, yet a light body on the surface is not carried forward, but, on the contrary, if the tide is ebbing, will recede from the shore; from which it would follow, that the motion is only propagated in the water, like sound in air, and not the mass of water protruded. A similar species of motion is observed on shaking at one end, a long cord held moderately slack, which is expressed by the word undulation. I have sometimes remarked, however, that a body which sinks deep, and takes hold of the water, appears to move towards shore

* It may be presumed that in this estimation of its height I was considerably deceived.

shore with the course of the surf, as is perceptible in a boat landing, which seems to shoot swiftly forward on the top of the swell; though probably it is only after having reached the summit, and may owe its velocity to its own weight in the descent.

Countries where the surfs prevail, require boats of a particular construction, and the art of managing them demands the experience of a man's life. All European boats are more or less unfit, and seldom fail to occasion the sacrifice of the people on board them, in the imprudent attempts that are sometimes made to land with them on the open coast. The natives of Coromandel are remarkably expert in the management of their craft; but it is to be observed, that the intervals between the breaking of the surfs are usually on that coast much longer than on the coast of Sumatra.

The force of the surf is extremely great. I have known it to overset a country vessel in such a manner, that the top of the mast has stuck in the sand, and the lower end made its appearance through her bottom. Pieces of cloth have been taken up from a wreck, twisted and rent by its involved motion. In some places the surfs are usually greater at high, and in others at low, water; but I believe they are uniformly more violent during the spring-tides.

Considerations respecting the cause of the surf.

I shall proceed to inquire into the efficient cause of the surfs. The winds have doubtless a strong relation to them. If the air was in all places of equal density, and not liable to any motion, I suppose the water would also remain perfectly at rest, and its surface even; abstracting from the general course of the tides; and the partial irregularities occasioned by the influx of rivers. The current of the air impels the water, and causes a swell, which is the regular rising and subsiding of the waves. This rise and fall is similar to the vibrations of a pendulum, and subject to like laws. When a wave is at its height, it descends by the force of gravity, and the momentum acquired in descending, impels the neighbouring particles, which, in their turn, rise and impel others, and thus form a succession of waves. This is the case in the open sea; but when the swell approaches the shore, and the depth of

water is not in proportion to the size of the swell, the subsiding wave, instead of pressing on a body of water, which might rise in equal quantity, presses on the ground, whose re-action causes it to rush on in that manner, which we call a surf. Some think that the peculiar form of it may be plainly accounted for from the shallowness and shelving of the beach. When a swell draws near to such a beach, the lower parts of the water meeting first with obstruction from the bottom, stand still, whilst the higher parts respectively move onward, by which a rolling and involved motion is produced, that is augmented by the return of the preceding swell. I object, that this solution is founded on the supposition of an actual progressive motion of the body of water in forming a surf; and that certainly not being the fact, it seems deficient. The only real progression of the water is occasioned by the perpendicular fall, after the breaking of the surf, when, from its weight, it foams on to a greater or less distance, in proportion to the height from which it fell, and the slope of the shore.

That the surfs are not, like common waves, the immediate effect of the wind, is evident from this, that the highest and most violent often happen when there is the least wind, and *vice versâ*. And sometimes the surfs will continue with an equal degree of violence during a variety of weather. On the west coast of Sumatra, the highest are experienced during the SE. monsoon, which is never attended with such gales of wind as the NW. The motion of the surf is not observed to follow the course of the wind, but often the contrary; and when it blows hard from the land, the spray of the sea may be seen to fly in a direction opposite to the body of it, though the wind has been for many hours in the same point.

Are the surfs the effect of gales of wind at sea, which do not happen to extend to the shore, but cause a violent agitation throughout a considerable tract of the waters, which motion communicating with less distant parts, and meeting at length with resistance from the shore, occasions the sea to swell and break in the manner described? To this I object, that there seems no regular correspondence between their magnitude, and the apparent agitation of the water without them; that gales of

of wind, except at particular periods, are very unfrequent in the Indian seas, where the navigation is well known to be remarkably safe, whilst the surfs are almost continual; and that gales are not found to produce this effect in other extensive oceans. The west coast of Ireland borders a sea nearly as extensive, and much more wild than the coast of Sumatra, and yet there, though when it blows hard the swell on the shore is high and dangerous, is there nothing that resembles the surfs of India.

Probable cause of the surf.

These, so general in the tropical latitudes, are, upon the most probable hypothesis I have been able to form, after long observation, and much thought and inquiry, the consequence of the trade or perpetual winds which prevail, at a distance from shore, between the parallels of thirty degrees north and south, whose uniform and invariable action causes a long and constant swell, that exists even in the calmest weather, about the line, towards which its direction tends from either side. This swell or libration of the sea, is so prodigiously long, and the sensible effect of its height, of course, so much diminished, that it is not often attended to; the gradual slope engrossing almost the whole horizon, when the eye is not very much elevated above its surface: but persons who have sailed in those parts may recollect that even when the sea is apparently the most still and level, a boat or other object at a distance from the ship, will be hidden from the sight of one looking towards it from the lower deck, for the space of minutes together. This swell, when a squall happens, or the wind freshens up, will, for the time, have other subsidiary waves on the extent of its surface, breaking often in a direction contrary to it, and which will again subside as a calm returns, without having produced on it any perceptible effect. Sumatra, though not continually exposed to the south-east trade-wind, is not so distant but that its influence may be presumed to extend to it, and accordingly at *Pulo Pisang*, near the southern extremity of the island, a constant southerly sea is observed, even after a hard north-west wind. This incessant and powerful swell rolling in from an ocean, open even to the pole, seems an agent adequate to the prodigious effects produced on the coast; whilst its very size contributes to its being overlooked. It reconciles almost all the difficulties which the phænomena seem to present, and in particular it accounts for the decrease of the surf during the NW. monsoon,

soon, the local wind then counteracting the operation of the general one; and it is corroborated by an observation I have made, that the surfs on the Sumatran coast ever begin to break at their southern extreme, the motion of the swell not being perpendicular to the direction of the shore. This manner of explaining their origin seems to carry much reason with it; but there occurs to me one objection which I cannot get over, and which a regard to truth obliges me to state. The trade-winds are remarkably steady and uniform, and the swell generated by them is the same. The surfs are much the reverse, seldom persevering for two days in the same degree of violence; often mountains high in the morning, and nearly subsided by night. How comes an uniform cause to produce effects so unsteady, unless by the intervention of secondary causes, whose nature and operation we are unacquainted with?

It is clear to me that the surfs, as above described, are peculiar to those climates which lie within the remoter limits of the trade-winds, though in higher latitudes large swells and irregular breakings of the sea are to be met with after boisterous weather. Possibly the following causes may be judged to conspire, with that I have already specified, towards occasioning this distinction. The former region being exposed to the immediate influence of the two great luminaries, the water, from their direct impulse, is liable to more violent agitation than nearer the poles, where their power is felt only by indirect communication. The equatorial parts of the earth performing their diurnal revolution, with greater velocity than the rest, a larger circle being described in the same time, the waters thereabout, from the stronger centrifugal force, may be supposed to feel less restraint from the sluggish principle of matter; to have less gravity; and therefore to be more obedient to external impulses of every kind, whether from the winds or any other cause.

Tides. The spring-tides on the west coast of Sumatra are estimated to rise in general no more than four feet, owing to its open, unconfined situation, which prevents any accumulation of the tide, as is the case in narrow seas. It is always high water there when the moon is in the horizon, and consequently at six o'clock nearly, on the days of conjunction and opposition

opposition throughout the year, in parts not far remote from the equator.* This, according to Newton's theory, is about three hours later than the uninterrupted course of nature; owing to the obvious impediment the waters meet with in revolving from the eastward.

Owing to this uniformity it becomes an easy matter for the natives to ascertain the height of the tide at any hour that the moon is visible. Whilst she appears to ascend, the water falls, and *vice versâ;* the lowest of the ebb happening when she is in her meridian. The vulgar rule for calculating the tides is rendered also to Europeans more simple and practical from the same cause. There only needs to add together the epact, number of the month, and day of the month; the sum of which, if under thirty, gives the moon's age—the excess, if over. Allow forty-eight minutes for each day, or which is the same, take four-fifths of the age, and it will give you the number of hours after six o'clock, at which high water happens. A readiness at this calculation is particularly useful in a country where the sea-beach is the general road for travelling.

Distinction

Distinction of Inhabitants.—Rejangs chosen for General Description.—Persons and Complexion.—Clothing and Ornaments.

General account of the inhabitants.

HAVING exhibited a general view of the island, as it is in the hands of nature, I shall now proceed to a description of the people who inhabit and cultivate it, and shall endeavour to distinguish the several species or classes of them, in such a manner as may best tend to perspicuity, and to furnish clear ideas of the matter.

Various modes of division.

The most obvious division, and which has been usually made by the writers of voyages, is that of *Mahometan* inhabitants of the sea coast, and *Pagans* of the inland country. This division, though not without its degree of propriety, is vague and imperfect; not only because each description of people differ considerably among themselves, but that the inland inhabitants are, in some places, Mahometans, and those of the coast, in others, what they term Pagans. It is not unusual with persons who have not resided in this part of the East, to call the inhabitants of the islands indiscriminately by the name of *Malays*. This is a more considerable error, and productive of greater confusion than the former. By attempting to reduce things to heads too general, we defeat the very end we propose to ourselves in defining them at all: we create obscurity where we wish to throw light. On the other hand, to attempt enumerating and distinguishing the variety, almost endless, of petty sovereignties and nations, into which this island is divided, many of which differ nothing in person or manners from their neighbours, would be a task both insurmountable and useless. I shall aim at steering a middle course, and accordingly shall treat of the inhabitants of Sumatra under the following summary distinctions, taking occasion as it may offer to mention the principal subdivisions. And first, it is proper to distinguish the empire of

of *Menangkabau* and the *Malays*; in the next place the *Achinese*; then the *Battas*; the *Rejangs*; and next to them the people of *Lampong*.[a]

Menangkabau being the principal sovereignty of the island, which formerly comprehended the whole, and still receives a shadow of homage from the most powerful of the other kingdoms, which have sprung up from its ruins, would seem to claim a right to precedence in description, but I have a sufficient reason for deferring it to a subsequent part of the work; which is, that the people of this empire, by their conversion to Mahometanism, and consequent change of manners, have lost in a greater degree than some neighbouring tribes, the genuine Sumatran character, which is the immediate object of my investigation. They are distinguished from the other inhabitants of this island by the appellation of *Orang Malāyo*, or Malays, which, however, they have in common with those of the coast of the Peninsula, and of many other islands; and the name is applied to every Mussulman speaking the Malayan as his proper language, and either belonging to, or claiming descent from, the ancient kingdom of Menangkabau; wherever the place of his residence may be. Beyond Bencoolen to the southward there are none to be met with, Malays.

[a] In the course of my inquiries amongst the natives, concerning the aborigines of the island, I have been informed of two different species of people dispersed in the woods, and avoiding all communication with the other inhabitants. These they call *Orang Kubu*, and *Orang Gugu*. The former are said to be pretty numerous, especially in that part of the country which lies between *Palembang* and *Jambi*. Some have at times been caught and kept as slaves in *Labun*; and a man of that place is now married to a tolerably handsome *Kubu* girl, who was carried off by a party that discovered their huts. They have a language quite peculiar to themselves, and they eat promiscuously whatever the woods afford, as deer, elephant, rhinoceros, wild hog, snakes, or monkeys. The *Gugu* are much scarcer than these, differing in little but the use of speech, from the *Orang Utan* of Borneo; their bodies being covered with long hair. There have not been above two or three instances of their being met with by the people of *Labun* (from whom my information is derived), and one of these was entrapped many years ago, in much the same manner as the carpenter in Pilpay's Fables caught the monkey. He had children by a *Labun* woman, which also were more hairy than the common race; but the third generation are not to be distinguished from others. The reader will bestow what measure of faith he thinks due to this relation, the veracity of which I do not pretend to vouch for. It has probably some foundation in truth, but is exaggerated in the circumstances.

with, excepting such as have been drawn thither by, and are in the pay of, Europeans. On the eastern side of the island they are settled at the entrance of almost all the navigable rivers, where they more conveniently indulge their habitual bent for trade and piracy. It must be observed, indeed, that in common speech the term *Malay*, like that of Moor in the continent of India, is almost synonymous with Mahometan; and when the natives of other parts learn to read the Arabic character, submit to circumcision, and practise the ceremonies of religion, they are often said *men-jàdi Malāyo*, "to become Malays," instead of the more correct expression *sudah māsuk islām*, "have embraced the faith." The distinction will appear more strongly from this circumstance, that whilst the sultan of *Anak Suñgei (Moco-moco)*, ambitious of imitating the sultan of *Menañgkabau*, styles himself and his immediate subjects Malays, his neighbour, the *Pañgeran* of *Suñgei Lāmo*, chief of the *Rejangs*, a very civilized Mahometan, and whose ancestors for some generations were of the same faith, seemed offended, in a conversation I had with him, at my supposing him (as he is usually considered) a Malay, and replied, with some emotion, "*Malayo tīdah*, sir; *orañg ūlū betul sāyo*. No Malay, sir; I am a genuine, aboriginal countryman." The two languages he wrote and talked (I know not if he be still living) with equal facility; but the *Rejang* he esteemed his mother tongue.

Attempts to ascertain from what quarter Sumatra was peopled, must rest upon mere conjecture. The adjacent peninsula (called by Europeans or other foreigners the Malayan Peninsula) presents the most obvious source of population; and it has accordingly been presumed that emigrants from thence supplied it and the other islands of the eastern Archipelago with inhabitants. By this opinion, adopted without examination, I was likewise misled, and, on a former occasion, spoke of the probability of a colony from the peninsula having settled upon the western coast of the island; but I have since learned from the histories and traditions of the natives of both countries, that the reverse is the fact, and that the founders of the celebrated kingdoms of *Johor*, *Siñgapūra*, and *Malacca*, were adventurers from Sumatra. Even at this day the inhabitants of the interior parts of the peninsula are a race entirely distinct from those of the two coasts.

Thus

Thus much it was necessary, in order to avoid ambiguity, to say in the first instance concerning the Malays, of whom a more particular account will be given in a subsequent part of the work.

As the most dissimilar among the other classes into which I have divided the inhabitants, must of course have very many points of mutual resemblance, and many of their habits, customs, and ceremonies, in common, it becomes expedient, in order to avoid a troublesome and useless repetition, to single out one class from among them, whose manners shall undergo a particular and full investigation, and serve as a standard for the whole; the deviation from which, in other classes, shall afterwards be pointed out, and the most singular and striking usages peculiar to each, superadded. Various circumstances induce me, on this occasion, to give the preference to the *Rejangs*, though a nation of but small account in the political scale of the island. They are placed in what may be esteemed a central situation, not geographically, but with respect to the encroachments of foreign manners and opinions, introduced by the Malays, from the north, and Javans from the south; which gives them a claim to originality, superior to that of most others. They are a people whose form of government and whose laws extend, with very little variation, over a considerable part of the island, and principally that portion where the connexions of the English lie. There are traditions of their having formerly sent forth colonies to the southward; and in the country of *Passummah*, the site of their villages is still pointed out; which would prove that they have formerly been of more consideration than they can boast at present. They have a proper language, and a perfect written character. These advantages point out the *Rejang* people as an eligible standard of description; and a motive equally strong that induces me to adopt them as such, is, that my situation and connexions in the island, led me to a more intimate and minute acquaintance with their laws and manners, than with those of any other class. I must premise, however, that the Malay customs having made their way, in a greater or less degree, to every part of Sumatra, it will be totally impossible to discriminate with entire accuracy, those which are original, from those which are borrowed: and of course, what I shall say of the *Rejangs*, will apply for the most part, not only to the Sumatrans in general

Nation of the Rejangs adopted as a standard of description.

neral, but may sometimes be, in strictness, proper to the Malays alone, and by them taught to the higher rank of country people.

Situation of the Rejang country.

The country of the *Rejangs* is divided, to the north-west, from the kingdom of *Anak Suñgei* (of which *Moco-moco* is the capital) by the small river of *Uri*, near that of *Kattaun*; which last, with the district of *Labūn* on its banks, bounds it on the north or inland side. The country of *Mūsī*, where *Palembang* River takes its rise, forms its limit to the eastward. *Bencoolen* River, precisely speaking, confines it on the south-east; though the inhabitants of the district called *Lemba*, extending from thence to *Silebar*, are entirely the same people, in manners and language. The principal rivers, besides those already mentioned, are *Laye*, *Pally*, and *Suñgeilamo*; on all of which the English have factories, the resident or chief being stationed at *Laye*.

Persons of the inhabitants.

The persons of the inhabitants of the island, though differing considerably in districts remote from each other, may in general be comprehended in the following description; excepting the Achinese, whose commixture with the Moors of the west of India, has distinguished them from the other Sumatrans.

General description.

They are rather below the middle stature; their bulk is in proportion; their limbs are for the most part slight, but well shaped, and particularly small at the wrists and ancles. Upon the whole they are gracefully formed, and I scarcely recollect to have ever seen one deformed person among the natives.* The women, however, have the preposterous custom of flattening the noses, and compressing the heads of children newly born, whilst the skull is yet cartilaginous, which increases their natural tendency to that shape. I could never trace the origin of the practice, or learn any other reason for moulding the features to this uncouth appearance,

* Ghirardini, an Italian painter, who touched at Sumatra on his way to China in 1698, observes of the Malays,

Son di persona tanto ben formata
Quanto mai finger san pittori industri.

He speaks in high terms of the country, as being beautifully picturesque.

pearance, but that it was an improvement of beauty in their estimation. Captain Cook takes notice of a similar operation at the island of *Ulietea*. They likewise pull out the ears of infants, to make them stand at an angle from the head. Their eyes are uniformly dark and clear; and among some, especially the southern women, bear a strong resemblance to those of the Chinese, in the peculiarity of formation so generally observed of that people. Their hair is strong, and of a shining black; the improvement of both which qualities it probably owes, in great measure, to the early and constant use of coco-nut oil, with which they keep it moist. The men frequently cut their hair short, not appearing to take any pride in it; the women encourage theirs to a considerable length, and I have known many instances of its reaching the ground. The men are beardless, and have chins so remarkably smooth, that were it not for the priests displaying a little tuft, we should be apt to conclude that nature had refused them this token of manhood. It is the same in respect to other parts of the body, with both sexes; and this particular attention to their persons, they esteem a point of delicacy, and the contrary an unpardonable neglect. The boys, as they approach to the age of puberty, rub their chins, upper lips, and those parts of the body that are subject to superfluous hair, with *chunam*, (*quick line*) especially of shells, which destroys the roots of the incipient beard. The few pilæ that afterwards appear, are plucked out from time to time with tweezers, which they always carry about them for that purpose. Were it not for the numerous and very respectable authorities, from which we are assured that the natives of America are naturally beardless, I should think that the common opinion on that subject had been rashly adopted, and that their appearing thus at a mature age, was only the consequence of an early practice, similar to that observed among the Sumatrans. Even now I must confess that it would remove some small degree of doubt from my mind, could it be ascertained, that no such custom prevails.*

Their

* It is allowed by travellers, that the Patagonians have tufts of hair on the upper lip and chin. Captain Carver says, that among the tribes he visited, the people made a regular practice of eradicating their beards with pincers. At Brussels is preserved, along with a variety of ancient and curious suits of armour, that of Montezuma, king of Mexico, of which

Their complexion is properly yellow, wanting the red tinge that constitutes a tawny or copper colour. They are in general lighter than the Mestees, or half breed, of the rest of India; those of the superior class, who are not exposed to the rays of the sun, and particularly their women of rank, approaching to a great degree of fairness. Did beauty consist in this one quality, some of them would surpass our brunettes in Europe. The major part of the females are ugly, and many of them even to disgust, yet there are those among them, whose appearance is strikingly beautiful; whatever composition of person, features, and complexion, that sentiment may be the result of.

Colour not ascribable to climate.

The fairness of the Sumatrans, comparatively with other Indians, situated as they are, under a perpendicular sun, where no season of the year affords an alternative of cold, is, I think, an irrefragable proof, that the difference of colour in the various inhabitants of the earth, is not the immediate effect of climate. The children of Europeans born in this island are as fair as those born in the country of their parents. I have observed the same of the second generation, where a mixture with the people of the country has been avoided. On the other hand, the offspring and all the descendants of the Guinea and other African slaves imported there, continue in the last instance as perfectly black as in the original stock. I do not mean to enter into the merits of the question which naturally connects with these observations; but shall only remark, that the sallow and adust countenances, so commonly acquired by Europeans who have long resided in hot climates, are more ascribable to the effect of bilious distempers, which almost all are subject to in a greater or less degree, than of their exposure to the influence of the weather, which few but seafaring people are liable to, and of which the impression is seldom permanent. From this circumstance I have been led to conjecture that the general disparity of complexions in different nations,

the visor, or mask for the face, has remarkably large whiskers; an ornament which those Americans could not have imitated, unless nature had presented them with the model.—See a paper in the Phil. Trans. for 1786, which puts this matter beyond a doubt. In a French dictionary of the Huron language, published in 1632, I observe a term corresponding to "arracher la barbe."

nations, might *possibly* be owing to the more or less copious secretion, or redundance of that juice, rendering the skin more or less dark according to the qualities of the bile prevailing in the constitutions of each. But I fear such an hypothesis would not stand the test of experiment, as it might be expected to follow, that upon dissection, the contents of a negro's gall-bladder, or at least the extravasated bile, should uniformly be found black. Persons skilled in anatomy will determine whether it is possible that the qualities of any animal secretion can so far affect the frame, as to render their consequences liable to be transmitted to posterity in their full force.*

The small size of the inhabitants, and especially of the women, may be in some measure owing to the early communication between the sexes; though, as the inclinations which lead to this intercourse are prompted here by nature sooner than in cold climates, it is not unfair to suppose, that being proportioned to the period of maturity, this is also sooner attained, and consequently that the earlier cessation of growth of these people, is agreeable to the laws of their constitution, and not occasioned by a premature and irregular appetite.

Persons of superior rank encourage the growth of their hand-nails, particularly those of the fore and little fingers, to an extraordinary length; frequently tinging them red, with the expressed juice of a shrub, which they call *inei*, the *henna* of the Arabians; as they do the nails of their feet also, to which, being always uncovered, they pay as much attention as to their hands. The hands of the natives, and even of the half breed, are always cold to the touch; which I cannot account for otherwise than by a supposition, that from the less degree of elasticity in the solids, occasioned by the heat of the climate, the internal action of the body, by which the fluids are put in motion, is less vigorous, the circulation is proportionably languid, and of course the diminished effect

* In an "Essay on the Causes of the Variety of Complexion and Figure in the Human Species," published at Philadelphia in 1787, the permanent effect of the bilious secretion, in determining the colour, is strongly insisted upon.

effect is most perceptible in the extremities, and a coldness there is the natural consequence.

Hill people subject to wens.

The natives of the hills, through the whole extent of the island, are subject to those monstrous wens from the throat, which have been observed of the Vallaisans, and the inhabitants of other mountainous districts in Europe. It has been usual to attribute this affection to the badness, thawed state, mineral quality, or other peculiarity of the waters; many skilful men having applied themselves to the investigation of the subject. My experience enables me to pronounce without hesitation, that the disorder, for such it is, though it appears here to mark a distinct race of people (*orang-gūnong*), is immediately connected with the hilliness of the country, and of course, if the circumstances of the water they use contribute thereto, it must be only so far as the nature of the water is affected by the inequality or height of the land. But in Sumatra neither snow nor other congelation is ever produced, which militates against the most plausible conjecture that has been adopted concerning the Alpine goitres. From every research that I have been enabled to make, I think I have reason to conclude, that the complaint is owing, among the Sumatrans, to the fogginess of the air in the vallies between the high mountains, where, and not on the summits, the natives of these parts reside. I before remarked, that between the ranges of hills, the *kabut* or dense mist was visible for several hours every morning; rising in a thick, opaque, and well-defined body, with the sun, and seldom quite dispersed till afternoon. This phænomenon, as well as that of the wens, being peculiar to the regions of the hills, affords a presumption that they may be connected; exclusive of the natural probability that a cold vapour, gross to an uncommon degree, and continually enveloping the habitations, should affect with tumours the throats of the inhabitants. I cannot pretend to say how far this solution may apply to the case of the goitres, but I recollect it to have been mentioned, that the only method of curing the people, is by removing them from the vallies to the clear and pure air on the tops of the hills; which seems to indicate a similar source of the distemper to what I have pointed out. The Sumatrans do not appear to attempt any remedy for it, the wens being consistent with the highest health in other respects.

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The personal difference between the Malays of the coast, and the country inhabitants, is not so strongly marked but that it requires some experience to distinguish them. The latter, however, possess an evident superiority in point of size and strength, and are fairer complexioned, which they probably owe to their situation, where the atmosphere is colder; and it is generally observed, that people living near the sea-shore, and especially when accustomed to navigation, are darker than their inland neighbours. Some attribute the disparity in constitutional vigour, to the more frequent use of opium among the Malays, which is supposed to debilitate the frame; but I have noted that the *Limūn* and *Batang Asei* gold traders, who are a colony of that race settled in the heart of the island, and who cannot exist a day without opium, are remarkably hale and stout; which I have known to be observed with a degree of envy by the opium-smokers of our settlements. The inhabitants of *Pasummah*, also, are described as being more robust in their persons, than the planters of the low country.

Difference in person between Malays and other Sumatrans.

The original clothing of the Sumatrans is the same with that found by navigators among the inhabitants of the South Sea islands, and now generally called by the name of Otaheitean cloth. It is still used among the *Rejangs* for their working dress, and I have one in my possession, procured from these people, consisting of a jacket, short drawers, and a cap for the head. This is the inner bark of a certain species of tree, beaten out to the degree of fineness required; approaching the more to perfection, as it resembles the softer kind of leather, some being nearly equal to the most delicate kid-skin; in which character it somewhat differs from the South Sea cloth, as that bears a resemblance rather to paper, or to the manufacture of the loom. The country people now conform in a great measure to the dress of the Malays, which I shall therefore describe in this place, observing that much more simplicity still prevails among the former, who look upon the others as coxcombs, who lay out all their substance on their backs, whilst, in their turns, they are regarded by the Malays with contempt, as unpolished rustics.

Clothing.

Man's dress. A man's dress consists of the following parts. A close waistcoat, without sleeves, but having a neck like a shirt, buttoned close up to the top, with buttons, often of gold filagree. This is peculiar to the Malays. Over this they wear the *baju*, which resembles a morning gown, open at the neck, but generally fastened close at the wrists and half way up the arm, with nine buttons to each sleeve. The sleeves, however, are often wide and loose, and others again, though nearly tight, reach not far beyond the elbow; especially of those worn by the younger females, which, as well as those of the young men, are open in front no farther down than the bosom, and reach no lower than the waist, whereas the others hang loose to the knees, and sometimes to the ancles. They are made usually of blue or white cotton cloth; for the better sort, of chintz; and for great men, of flowered silks. The *kāin sarong* is not unlike a Scots highlander's plaid in appearance, being a piece of party-coloured cloth about six or eight feet long, and three or four wide, sewed together at the ends; forming, as some writers have described it, a wide sack without a bottom. This is sometimes gathered up, and slung over the shoulder like a sash, or else folded and tucked about the waist and hips; and in full dress it is bound on by the belt of the *kris* (dagger), which is of crimson silk, and wraps several times round the body, with a loop at the end, in which the sheath of the *kris* hangs. They wear short drawers, reaching half way down the thigh, generally of red or yellow taffeta. There is no covering to their legs or feet. Round their heads they fasten, in a particular manner, a fine, coloured handkerchief, so as to resemble a small turban; the country people usually twisting a piece of white or blue cloth for this purpose. The crown of their head remains uncovered, except on journeys, when they wear a *tūdong* or umbrella-hat, which completely screens them from the weather.

Woman's dress. The women have a kind of bodice, or short waistcoat rather, that defends the breasts, and reaches to the hips. The *kāin sarong*, before described, comes up as high as the armpits, and extends to the feet, being kept on simply by folding and tucking it over, at the breast, except when the *tali-pending*, or zone, is worn about the waist, which forms

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an additional and necessary security. This is usually of embroidered cloth, and sometimes a plate of gold or silver, about two inches broad, fastening in the front with a large clasp of filagree or chased work, with some kind of precious stone, or imitation of such, in the centre. The *baju*, or upper gown, differs little from that of the men, buttoning in the same manner at the wrists. A piece of fine, thin, cotton cloth, or slight silk, about five feet long, and worked or fringed at each end, called a *salendang*, is thrown across the back of the neck, and hangs down before; serving also the purpose of a veil to the women of rank when they walk abroad. The handkerchief is carried, either folded small in the hand, or in a long fold, over the shoulder. There are two modes of dressing the hair, one termed *kūndei*, and the other *sañggol*. The first resembles much the fashion in which we see the Chinese women represented in paintings, and which I conclude they borrowed from thence, where the hair is wound circularly over the centre of the head, and fastened with a silver bodkin or pin. In the other mode, which is more general, they give the hair a single twist as it hangs behind, and then doubling it up, they pass it crosswise, under a few hairs separated from the rest, on the back of the head, for that purpose. A comb, often of tortoise-shell, and sometimes filagreed, helps to prevent it from falling down. The hair of the front, and of all parts of the head, is of the same length, and when loose, hangs together behind, with most of the women, in very great quantity. It is kept moist with oil, newly expressed from the coco-nut; but those persons who can afford it make use also of an empyreumatic oil extracted from gum benzoin, as a grateful perfume. They wear no covering, except ornaments of flowers, which, on particular occasions, are the work of much labour and ingenuity. The head-dresses of the dancing girls by profession, who are usually Javans, are very artificially wrought, and as high as any modern English lady's cap, yielding only to the feathered plumes of the year 1777. It is impossible to describe in words these intricate and fanciful matters, so as to convey a just idea of them. The flowers worn in undress are, for the most part, strung in wreaths, and have a very neat and pretty effect, without any degree of gaudiness, being usually white or pale yellow, small, and frequently only half-blown. Those generally chosen for these occasions, are the *buñga-tanjong* and *buñga-mellūr*: the *buñga-chumpaka* is used to give

the hair a fragrance, but is concealed from the sight. They sometimes combine a variety of flowers in such a manner as to appear like one, and fix them on a single stalk; but these, being more formal, are less elegant, than the wreaths.

Distinguishing ornaments of virgins.

Among the country people, particularly in the southern countries, the virgins *(anak gaddīs*, or goddesses, as it is usually pronounced) are distinguished by a fillet which goes across the front of the hair, and fastens behind. This is commonly a thin plate of silver, about half an inch broad: those of the first rank have it of gold, and those of the lowest class have their fillet of the leaf of the *nīpah* tree. Beside this peculiar ornament, their state is denoted by their having rings or bracelets of silver or gold on their wrists. Strings of coins round the neck are universally worn by children, and the females, before they are of an age to be clothed, have, what may not be inaptly termed, a modesty-piece, being a plate of silver in the shape of a heart (called *chaping*) hung before, by a chain of the same metal, passing round the waist. The young women in the country villages manufacture themselves the cloth that forms the body-dress, or *kāīn-sarong*, which, for common occasions, is their only covering, and reaches from the breast no lower than the knees. The dresses of the women of the Malay bazars, on the contrary, extend as low as the feet; but here, as in other instances, the more scrupulous attention to appearances does not accompany the superior degree of real modesty. This cloth, for the wear both of men and women, is imported from the island of Celebes, or, as it is here termed, the *Buggis* country.

Mode of filing teeth.

Both sexes have the extraordinary custom of filing and otherwise disfiguring their teeth, which are naturally very white and beautiful from the simplicity of their food. For files, they make use of small whetstones of different degrees of fineness, and the patients lie on their back during the operation. Many, particularly the women of the *Lampong* country, have their teeth rubbed down quite even with the gums; others have them formed in points; and some file off no more than the outer coat and extremities, in order that they may the better receive and retain the jetty blackness, with which they almost universally adorn them. The black

black used on these occasions is the empyreumatic oil of the coconut shell. When this is not applied, the filing does not, by destroying what we term the enamel, diminish the whiteness of the teeth; but the use of betel renders them black, if pains be not taken to prevent it. The great men sometimes set theirs in gold, by casing, with a plate of that metal, the under row; and this ornament, contrasted with the black dye, has, by lamp or candle light, a very splendid effect. It is sometimes indented to the shape of the teeth, but more usually quite plain. They do not remove it either to eat or sleep.

At the age of about eight or nine, they bore the ears and file the teeth of the female children; which are ceremonies that must necessarily precede their marriage. The former they call *betendé*, and the latter *bedabong*; and these operations are regarded in the family, as the occasion of a festival. They do not here, as in some of the adjacent islands, (of *Nias* in particular) increase the aperture of the ear to a monstrous size, so as in many instances to be large enough to admit the hand, the lower parts being stretched till they touch the shoulders. Their earrings are mostly of gold filagree, and fastened, not with a clasp, but in the manner of a rivet or nut screwed to the inner part.

Villages.—Buildings.—Domestic Utensils.—Food.

I SHALL now attempt a description of the villages and buildings of the Sumatrans, and proceed to their domestic habits of œconomy, and those simple arts, on which the procuring of their food and other necessaries depends. These are not among the least interesting objects of philosophical speculation. In proportion as the arts in use with any people are connected with the primary demands of nature, they carry the greater likelihood of originality, because those demands must have been administered to, from a period coeval with the existence of the people themselves. Or if complete originality be regarded as a visionary idea, engendered from ignorance and the obscurity of remote events, such arts must be allowed to have the fairest claim to antiquity at least. Arts of accommodation, and more especially of luxury, are commonly the effect of imitation, and suggested by the improvements of other nations, which have made greater advances towards civilisation. These afford less striking and characteristic features, in delineating the picture of mankind, and though they may add to the beauty, diminish from the genuineness of the piece. We must not look for unequivocal generic marks, where the breed, in order to mend it, has been crossed by a foreign mixture. All the arts of primary necessity are comprehended within two distinctions: those which protect us from the inclemency of the weather and other outward accidents; and those which are employed in securing the means of subsistence. Both are immediately essential to the continuance of life, and man is involuntarily and immediately prompted to exercise them, by the urgent calls of nature, even in the merest possible state of savage and uncultivated existence. In climates like that of Sumatra, this impulse extends not far. The human machine is kept going with small effort, in so favourable a medium. The spring of importunate necessity there soon loses its force, and consequently the wheels of invention that depend upon it, fail to perform more than a

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few simple revolutions. In regions less mild, this original motive to industry and ingenuity, carries men to greater lengths, in the application of arts to the occasions of life; and these, of course, in an equal space of time, attain to greater perfection, than among the inhabitants of the tropical latitudes, who find their immediate wants supplied with facility, and prefer the negative pleasure of inaction, to the enjoyment of any conveniences that are to be purchased with exertion and labour. This consideration may perhaps tend to reconcile the high antiquity universally allowed to Asiatic nations, with the limited progress of arts and sciences among them; in which they are manifestly surpassed by people who, compared with them, are but of very recent date.

The Sumatrans, however, in the construction of their habitations, have stept many degrees beyond those rude contrivances which writers describe the inhabitants of some other Indian countries to have been contented with adopting, in order to screen themselves from the immediate influence of surrounding elements. Their houses are not only permanent, but convenient, and are built in the vicinity of each other, that they may enjoy the advantages of mutual assistance and protection, resulting from a state of society.[a]

Villages.

The *dusuns* or villages (for the small number of inhabitants assembled in each does not entitle them to the appellations of towns) are always situated on the banks of a river or lake, for the convenience of bathing, and of transporting goods. An eminence difficult of ascent is usually made choice of for security. The access to them is by foot-ways, narrow and winding, of which there are seldom more than two; one to the country, and the other to the water; the latter in most places so steep, as to render it necessary to cut steps in the cliff or rock. The *dusuns* being surrounded with abundance of fruit trees, some of considerable height, as the *durian*, *coco*, and *betel-nut*, and the neighbouring country, for

[a] In several of the small islands near Sumatra (including the *Nicobars*) whose inhabitants in general are in a very low state of civilisation, the houses are built circularly. Vid. As. Researches, vol. iv. p. 129. plate.

for a little space about, being in some degree cleared of wood for the rice and pepper plantations, these villages strike the eye at a distance as clumps merely, exhibiting no appearance of a town or any place of habitation. The rows of houses form commonly a quadrangle, with passages or lanes at intervals between the buildings, where, in the more considerable villages, live the lower class of inhabitants, and where also their *padi*-houses or granaries are erected. In the middle of the square stands the *balei* or town hall, a room about fifty to an hundred feet long, and twenty or thirty wide, without division, and open at the sides, excepting when on particular occasions it is hung with mats or chintz; but sheltered in a lateral direction by the deep overhanging roof.

Buildings. In their buildings neither stone, brick, nor clay, are ever made use of, which is the case in most countries where timber abounds, and where the warmth of the climate renders the free admission of air, a matter rather to be desired, than guarded against: but in Sumatra the frequency of earthquakes is alone sufficient to have prevented the natives from adopting a substantial mode of building. The frames of the houses are of wood, the underplate resting on pillars of about six or eight feet in height, which have a sort of capital, but no base, and are wider at top than at bottom. The people appear to have no idea of architecture as a science, though much ingenuity is often shewn in the manner of working up their materials, and they have, the Malays at least, technical terms corresponding to all those employed by our house carpenters. Their conception of proportions is extremely rude, often leaving those parts of a frame which have the greatest bearing, with the weakest support, and lavishing strength upon inadequate pressure. For the floorings they lay whole *bamboos* (a well-known species of large cane) of four or five inches diameter, close to each other, and fasten them at the ends to the timbers. Across these are laid laths of split bamboo, about an inch wide and of the length of the room, which are tied down with filaments of the *rattan;* and over these are usually spread mats of different kinds. This sort of flooring has an elasticity alarming to strangers when they first tread on it. The sides of the houses are generally closed in with *palupo*, which is the bamboo opened, and rendered flat by notching or splitting the circular joints on the outside, chipping away the corresponding

ponding divisions within, and laying it to dry in the sun, pressed down with weights. This is sometimes nailed on to the upright timbers or bamboos, but in the country parts, it is more commonly interwoven, or matted, in breadths of six inches, and a piece, or sheet, formed at once of the size required. In some places they use for the same purpose the *kulitkayu*, or coolicoy, as it is pronounced by the Europeans, who employ it on board ship, as dunnage, in pepper and other cargoes. This is a bark procured from some particular trees, of which the *bunut* and *ĭbu* are the most common. When they prepare to take it, the outer rind is first torn or cut away; the inner, which affords the material, is then marked out with a *prang*, *pateel*, or other tool, to the size required, which is usually three cubits by one; it is afterwards beaten for some time with a heavy stick, to loosen it from the stem, and beeing peeled off, is laid in the sun to dry, care being taken to prevent its warping. The thicker or thinner sorts of the same species of *kulitkayu*, owe their difference to their being taken nearer to, or farther from, the root. That which is used in building has nearly the texture and hardness of wood. The pliable and delicate bark of which clothing is made, is procured from a tree called *kalawi*, a bastard species of the bread-fruit.

The most general mode of covering houses is with the *atap*, which is the leaf of a species of palm called *nīpah*. These, previous to their being laid on, are formed into sheets of about five feet long, and as deep as the length of the leaf will admit, which is doubled at one end over a slip or lath of bamboo; they are then disposed on the roof, so as that one sheet shall lap over the other, and are tied to the bamboos which serve for rafters. There are various other and more durable kinds of covering used. The *kulitkayu*, before described, is sometimes employed for this purpose: the *galumpei*—this is a thatch of narrow, split bamboos, six feet in length, placed in regular layers, each reaching within two feet of the extremity of that beneath it, by which a treble covering is formed: *ĭju*—this is a vegetable production, so nearly resembling horse-hair, as scarcely to be distinguished from it. It envelops the stem of that species of palm called *anau*, from which the best toddy or palm wine is procured, and is employed by the natives for a great variety of

purposes. It is bound on as a thatch, in the manner we do straw, and not unfrequently over the *galumpei*; in which case the roof is so durable as never to require renewal, the *iju* being of all vegetable substances the least prone to decay, and for this reason it is a common practice to wrap a quantity of it round the ends of timbers or posts which are to be fixed in the ground. I saw a house about twenty miles up *Manna* River, belonging to *Dupati Bandar Agung*, the roof of which was of fifty years standing. The larger houses have three pitches in the roof; the middle one, under which the door is placed, being much lower than the other two. In smaller houses there are but two pitches which are always of unequal height, and the entrance is in the smaller, which covers a kind of hall, or cooking room.

There is another kind of house, erected mostly for a temporary purpose, the roof of which is flat, and is covered in a very uncommon, simple, and ingenious manner. Large, straight bamboos are cut of a length sufficient to lie across the house, and being split exactly in two, and the joints knocked out, a first layer of them is disposed in close order, with the inner or hollow sides up; after which a second layer, with the outer or convex sides up, is placed upon the others in such manner, that each of the convex falls into the two contiguous concave pieces, covering their edges; the latter serving as gutters to carry off the water that falls upon the upper or convex layer.*

The mode of ascent to the houses is by a piece of timber, or stout bamboo, cut in notches, which latter an European cannot avail himself of, especially as the precaution is seldom taken of binding them fast. These are the wonderful light scaling ladders, which the old Portuguese writers described to have been used by the people of Achin in their wars with their nation. It is probable that the apprehension of danger from the wild beasts, caused them to adopt and continue this rude expedient, in preference to more regular and commodious steps. The detached buildings

* I find that the original inhabitants of the Philippine islands covered their buildings in the same manner.

buildings in the country, near to their plantations, called *talāngs*, they raise to the height of ten or twelve feet from the ground, and make a practice of taking up their ladder at night, to secure themselves from the destructive ravages of the tigers. I have been assured, but do not pledge myself for the truth of the story, that an elephant, attempting to pass under one of these houses, which stand on four or six posts, stuck by the way; but disdaining to retreat, carried it, with the family it contained, on his back, to a considerable distance.

In the buildings of the *dusuns*, particularly where the most respectable families reside, the wood-work in front is carved, in the style of bas-relief, in a variety of uncouth ornaments and grotesque figures, not much unlike the Egyptian hieroglyphics, but certainly without any mystic or historical allusion.

The furniture of their houses, corresponding with their manner of living, is very simple, and consists of but few articles. Their bed is a mat, usually of fine texture, and manufactured for the purpose, with a number of pillows, worked at the ends, and adorned with a shining substance that resembles foil. A sort of canopy or valance, formed of various coloured cloths, hangs over head. Instead of tables, they have what resemble large wooden salvers, with feet, called *dulang*; round each of which three or four persons dispose themselves; and on these are laid the *talams* or brass waiters, which hold the cups that contain their curry, and plantain leaves, or matted vessels, filled with rice. Their mode of sitting is not cross-legged, as the inhabitants of Turkey and our tailors use, but either on the haunches, or on the left side, supported by the left hand, with the legs tucked in on the right side; leaving that hand at liberty, which they always, from motives of delicacy, scrupulously eat with; the left being reserved for less cleanly offices. Neither knives, spoons, nor any substitutes for them, are employed; they take up the rice, and other victuals, between the thumb and fingers, and dexterously throw it into the mouth by the action of the thumb, dipping frequently their hands in water as they eat. Furniture.

The have a little coarse china ware, imported by the eastern praws, which Utensils.

which is held a matter of luxury. In cooking they employ a kind of iron vessel, well known in India by the name of *quallie* or tauch, resembling in shape the pans used in some of our manufactures, having the rim wide, and bottom narrow. These are likewise brought from the eastward. The *prĭu* and *balanĭga*, species of earthen pipkins, are in more common use, being made in small quantities in different parts of the island, particularly in *Lampong*, where they give them a sort of glazing; but the greater number of them are imported from Bantam. The original Sumatran vessel for boiling rice, and which is still much used for that purpose, is the *bamboo;* that material of general utility, with which bountiful nature has supplied an indolent people. By the time the rice is dressed, the utensil is nearly destroyed by the fire, but resists the flame so long as there is moisture within.

Fires.

Fire being wanted among these people but occasionally, and only when they cook their victuals, there is not much attention paid, in their buildings, to provide conveniences for it. Their houses have no chimneys, and their fire-places are no more than a few loose bricks or stones, disposed in a temporary manner, and frequently on the landing-place before the doors. The fuel made use of is wood alone; the coal which the island produces never being converted by the inhabitants to that purpose. The flint and steel for striking fire are common in the country, but it is a practice certainly borrowed from some other people, as that species of stone is not a native of the soil. These generally form part of their travelling apparatus, and especially with those men called *rĭsaus* (spendthrifs that turn freebooters), who find themselves often obliged to take up their habitation in the woods, or in deserted houses. But they also frequently kindle fire from the friction of two sticks. They chuse a piece of dry, porous wood, and cutting smooth a spot of it, lay it in an horizontal direction. They then apply a smaller piece, of a harder substance, with a blunt point, in a perpendicular position, and turn it quickly round, between the two hands, as chocolate is milled, pressing it downwards at the same time. A hole is soon formed by this motion of the smaller stick; but it has not penetrated far before the larger one takes fire. I have also seen the same effect produced, more

Mode of kindling them.

more simply, by rubbing one bit of bamboo, with a sharp edge, across another.

Water is conveyed from the spring, in bamboos, which, for this purpose are cut, either to the length of five or six feet, and carried over the shoulder, or into a number of single joints, that are put together in a basket. It is drunk out of the fruit called *labu* here, resembling the *calabash* of the West Indies, a hole being made in the side of the neck, and another at top for vent. In drinking, they generally hold the vessel at a distance above their mouths, and catch the stream as it falls; the liquid descending to the stomach without the action of swallowing. Baskets (*bronong*, *bakūl*) are a considerable part of the furniture of a man's

This mode of kindling fire is not peculiar to Sumatra: we read of the same practice in Africa, and even in Kamtschatka. It is surprising, but confirmed by abundant authority, that many nations of the earth, have, at certain periods, being ignorant of the use of fire. To our immediate apprehension, human existence would seem in such circumstances impossible. Every art, every convenience, every necessary of life, is now in the most intimate manner connected with it: and yet the Chinese, the Egyptians, the Phœnicians, and Greeks, acknowledged traditions concerning its first discovery in their respective countries. But, in fact, if we can once suppose a man, or society of men, unacquainted with the being and uses of this element, I see no difficulty in conceiving the possibility of their supporting life without it; I mean in the tropical climates; and of centuries passing before they should arrive at the important discovery. It is true, that lightning and its effects, volcanos, the firing of dry substances by fortuitous attrition, or of moist, by fermentation, might give them an idea of its violent and destructive properties; but far from being thence induced to appropriate and apply it, they would, on the contrary, dread and avoid it, even in its less formidable appearances. They might be led to worship it as their deity, but not to cherish it as their domestic. There is some reason to conclude that the man who first reduced it to subjection, and rendered it subservient to the purposes of life, procured it from the collision of two flints; but the sparks thus produced, whether by accident or design, might be observed innumerable times, without its suggesting a beneficial application. In countries where those did not present themselves, the discovery had, most probably, its origin in the rubbing together of dry sticks, and in this operation, the agent and subject co-existing, flame, with its properties and uses, became more immediately apparent. Still, as no previous idea was conceived of this latent principle, and consequently no search made, no endeavours exerted, to bring it to light, I see not the impossibility *a priori*, of its remaining almost as long concealed from mankind, as the properties of the loadstone, or the qualities of gunpowder.

man's house, and the number of these seen hanging up, are tokens of the owner's substance; for in them his harvests, of rice or pepper, are gathered and brought home; no carts being employed in the interior parts of the island which I am now describing. They are made of slips of bamboo, connected by means of split rattans; and are carried, chiefly by the women, on the back, supported by a string or band across the forehead.

Food. Although the Sumatrans live, in a great measure, upon vegetable food, they are not restrained, by any superstitious opinion, from other aliments, and accordingly, at their entertainments, the flesh of the buffalo (*karbau*), goat, and fowls, are served up. Their dishes are almost all prepared in that mode of dressing to which we have given the name of curry (from a Hindostanic word), and which is now universally known in Europe. It is called in the Malay language, *gūlei*, and may be composed of any kind of edible, but is generally of flesh or fowl, with a variety of pulse and succulent herbage, stewed down with certain ingredients, by us termed, when mixed and ground together, curry-powder. These ingredients are, among others, the cayenne or chili pepper, turmeric, *sarei* or lemon-grass, cardamums, garlick, and the pulp of the coconut bruised to a milk resembling that of almonds, which is the only liquid made use of. This differs from the curries of Madras and Bengal, which have greater variety of spices, and want the coconut. It is not a little remarkable, that the common pepper, the chief produce and staple commodity of the country, is never mixed by the natives in their food. They esteem it heating to the blood, and ascribe a contrary effect to the cayenne; which, I can say, my own experience justifies. A great diversity of curries is usually served up at the same time, in small vessels, each flavoured, to a nice discerning taste, in a different manner; and in this consists all the luxury of their tables. Let their quantity, or variety, of meat, be what it may, the principle article of their food is rice, which is eaten in a large proportion with every dish, and very frequently without any other accompaniment than salt and chili pepper. It is prepared by boiling in a manner peculiar to India; its perfection, next to cleanness and whiteness, consisting in its being, when thoroughly dressed and soft to the heart, at the same time whole and

and separate, so that no two grains shall adhere together. The manner of effecting this, is by putting into the earthen or other vessel in which it is boiled a quantity of water sufficient to cover it; letting it simmer over a slow fire; taking off the water by degrees with a flat ladle or spoon, that the grain may dry, and removing it when just short of burning. At their entertainments, the guests are treated with rice prepared also in a variety of modes, by frying it in cakes, or boiling a particular species of it, mixed with the kernel of the coconut and fresh oil, in small joints of bamboo. This is called *lemmang*. Before it is served up, they cut off the outer rind of the bamboo, and the soft inner coat is peeled away by the person who eats.

They dress their meat immediately after killing it, while it is still warm, which is conformable with the practice of the ancients, as recorded in Homer and elsewhere, and in this state it is said to eat tenderer than when kept for a day: longer the climate will not admit of, unless when it is preserved in that mode called *dinding*. This is the flesh of the buffalo cut into small thin steaks, and exposed to the heat of the sun in fair weather, generally on the thatch of their houses, till it is become so dry and hard as to resist putrefaction, *without any assistance from salt.* Fish is preserved in the same manner, and cargoes of both are sent from parts of the coast, where they are in plenty, to those where provisions are in more demand. It is seemingly strange, that heat, which, in a certain degree, promotes putrefaction, should, when violently increased, operate to prevent it; but it must be considered that moisture also is requisite to the former effect, and this is absorbed in thin substances, by the sun's rays, before it can contribute to the production of maggots. Flesh-meat.

Blachang, a preservation, if it may be so termed, of an opposite kind, is esteemed a great delicacy among the Malays, and is by them exported to the west of India. The country Sumatrans seldom procure it. It is a species of caviare, and is extremely offensive and disgusting to persons who are not accustomed to it, particularly the black kind, which is the most common. The best sort, or the red *blachang*, is made of the spawn of shrimps, or of the shrimps themselves, which they take about the mouths of rivers. They are, after boiling, exposed to the sun to dry, then

then pounded in a mortar, with salt, moistened with a little water, and formed into cakes, which is all the process. The black sort, used by the lower class, is made of small fish, prepared in the same manner. On some parts of the east coast of the island, they salt the roes of a large fish of the shad kind, and preserve them perfectly dry, and well flavoured. These are called *trobo.*

When the natives kill a buffalo, which is always done at their public meetings, they do not cut it up into joints, as we do an ox, but into small pieces of flesh, or steaks, which they call *bantei.* The hide of the buffalo is sometimes scalded, scraped, and hung up to dry in their houses, where it shrivels and becomes perfectly hard. When wanted for use, a piece is chopped off, and being stewed down for a great number of hours, in a small quantity of water, forms a rich jelly, which, properly seasoned, is esteemed a very delicate dish.

The sago (*sagu*), though common on Sumatra, and used occasionally by the natives, is not an article of food of such general use among them, as with the inhabitants of many other eastern islands, where it is employed as a substitute for rice. Millet (*randa jawa*) is also cultivated for food, but not in any considerable quantity.

When these several articles of subsistence fail, the Sumatran has recourse to those wild roots, herbs, and leaves of trees, which the woods abundantly afford in every season, without culture, and which the habitual simplicity of his diet teaches him to consider as no very extraordinary circumstance of hardship. Hence it is that famines in this island, or, more properly speaking, failures of crops of grain, are never attended with those dreadful consequences, which more improved countries and more provident nations experience.

Agriculture.—Rice, its Cultivation, &c.—Plantations of Coconut, Betel-nut, and other Vegetables for domestic Use.—Dye Stuffs.

FROM their domestic œconomy I am led to take a view of their labours in the field, their plantations and the state of agriculture amongst them, which an ingenious writer esteems the justest criterion of civilization. Agriculture.

The most important article of cultivation, not in Sumatra alone, but throughout the East, is rice. It is the grand material of food, on which an hundred millions of the inhabitants of the earth subsist, and although chiefly confined by nature to the regions included between, and bordering on the tropics, its cultivation is probably more extensive than that of wheat, which the Europeans are wont to consider as the universal staff of life. In the continent of Asia, as you advance to the northward, you come to the boundary where the plantations of rice disappear, and the wheat fields commence; the cold felt in that climate, owing in part to the height of the land, being unfriendly to the production of the former article. Rice.

Rice (*oryza sativa*) whilst in the husk is called *padi* by the Malays (from whose language the word seems to have found its way to the maritime parts of the continent of India), *bras* when deprived of the husk, and *nāsī* after it has been boiled; besides which it assumes other names in its various states of growth and preparation. This minuteness of distinction applies also to some other articles of common use, and may be accounted for upon this principle; that amongst people whose general objects of attention are limited, those which do of necessity occupy them, are liable to be more the subject of thought and conversation than in more enlightened countries, where the ideas of men have an extensive range. The kinds of rice also (whether technically of different species I cannot pronounce) are very numerous, but divided in the first place

into the two comprehensive classes of *padi ladang* or upland, from its growing in high, dry grounds, and *padi sawah* (vulgarly pronounced *sawur* or *sour*) or low-land, from its being planted in marshes; each of which is said to contain ten or fifteen varieties, distinct in shape, size, and colour of the grain, modes of growth, and delicacy of flavour; it being observed that in general the larger grained rice is not so much prized by the natives as that which is small, when at the same time white and in some degree transparent.[a] To M. POIVRE, in his Travels of a Philosopher, we are indebted for first pointing out these two classes, when speaking of the agriculture of Cochin-china. The qualities of the *ladang*, or upland rice, are held to be superior to those of the *sawah*, being whiter, more nourishing, better tasted, and having the advantage in point of keeping. Its mode of culture, too, is free from the charge of unhealthiness attributed to the latter, which is of a watery substance, is attended with

[a] The following sorts of dry-ground *padi* have come under my notice, but as the names vary in different districts, it is possible that some of these may be repetitions, where there is no striking difference of character—*Padi Ebbas*, large grain, very common;—*Andalong*, short round grain, grows in whorles or bunches round the stalk, common;—*Galu*, light coloured, scarce;—*Sini*, small grain, deep coloured, scarce;—*ijū*, lightish colour, scarce;—*Kuning*, deep yellow, crooked and pointed, fine rice;—*Kukur-ballum*, small, much crooked and resembling a dove's claw, from whence the name; light coloured, highly esteemed for its delicate flavour;—*Pisang*, outer coat light brown, inner red, longer, smaller, and less crooked than the preceding;—*Briñgin*, long, flattish, ribbed, pointed, dead yellow;—*Bujūt*, shaped like the preceding, but with a tinge of red in the colour;—*Charíap*, short, roundish, reddish yellow;—*Jañggūt* or bearded, small, narrow, pale brown;—*Jambī*, small, somewhat crooked and pointed, light brown;—*Laye*, gibbous, light coloured;—*Musang*, long, small, crooked and pointed, deep purple;—*Pandan*, small, light coloured;—*Paū*, long, crooked and pointed, light yellow;—*Pūyūh*, small, delicate, crooked and pointed, bright ochre;—*Rakkun*, roundish grain, resembles the *andalong*, but larger and deeper colour;—*Sihong*, much resembles the *Laye* in shape and colour;—*Sutar*, short, roundish, bright, reddish brown;—*Pūlut gading* or ivory, long, nearly straight, light yellow;—*Pūlut kechit*, small, crooked, reddish yellow;—*Pūlut bram*, long and rather large grain, purple when fresh more nearly red;—*Pūlut bram lematong*, in shape like the preceding, but of dead pale colour. Beside these four there is also a black kind of *Pūlut*. Samples of most of these have been in my possession for a number of years, and still continue perfectly sound. Of the sorts of rice growing in low grounds I have not specimens. The *padi santong*, which is small, straight, and light coloured, is held to be the finest. In the Lampong country they make a distinction of *padi krawang* and *padi jerru*, of which I know nothing more than that the former is a month earlier in growth than the latter.

with less increase in boiling, and is subject to a swifter decay; but of this the rate of produce from the seed is much greater, and the certainty of the crops more to be depended on. It is accordingly cheaper, and in more common use. The seed of each sort is kept separate by the natives, who assert that they will not grow reciprocally.

For the cultivation of upland *padi* the site of woods is universally preferred, and the more ancient the woods the better, on account of the superior richness of the soil; the continual fall and rotting of the leaves forming there a bed of vegetable mould, which the open plains do not afford, being exhausted by the powerful operation of the sun's rays, and the constant production of a rank grass called *lalang*. When this grass, common to all the eastern islands, is kept under by frequent mowing or the grazing of cattle (as is the case near the European settlements), its room is supplied by grass of a finer texture. Many suppose that the same identical species of vegetable undergoes this alteration, as no fresh seeds are sown, and the substitution uniformly takes place. But this is an evident mistake, as the generic characters of the two are essentially different; the one being the *gramen caricosum*, and the other the *gramen aciculatum*, described by Rumphius. The former, which grows to the height of five feet, is remarkable for the whiteness and softness of the down or blossom, and the other for the sharpness of its bearded seeds, which prove extremely troublesome to the legs of those who walk among it.[a] If old woods are not at hand, ground covered with that of younger growth, termed *balūkar*, is resorted to; but not, if possible, under the Upland rice.

[a] "Gramen hoc (caricosum) totos occupat campos, nudosque colles tam densè et lætè germinans, ut e longinquo haberetur campus oryza consitus, tam luxuriosè ac fortiter crescit, ut neque hortos neque sylvas evitet, atque tam vehementer prorepit, ut areæ vix depurari ac servari possint, licet quotidie deambulentur . . . . . Potissimum amat solum flavum arguillosum." (Gramen aciculatum) "Usus ejus ferè nullus est, sed hic detegendum est tædiosum ludibrium, quod quis habet, si quis per campos vel in sylvis procedat, ubi hoc gramen ad vias publicas crescit, quum prætereuntium vestibus, hoc semen quam maxime inhæret." Rumphius, vol. vi. lib. x. chap. 8. and 13. M. Poivre describes the plains of Madagascar and Java as covered with a long grass which he calls *Fatak*, and which from the analogy of the countries in other respects, I should suppose to be the *lalang*; but he praises it as affording excellent pasturage; whereas in Sumatra it is reckoned the worst, and except when very young it is not edible by the largest cattle; for which reason the carters

age of four or five years. Vegetation is there so strong, that spots which had been perfectly cleared for cultivation, will, upon being neglected for a single season, afford shelter to the beasts of the forest; and the same being rarely occupied for two successive years, the face of the country continues to exhibit the same wild appearance, although very extensive tracts are annually covered with fresh plantations. From this it will be seen, that in consequence of the fertility to which it gives occasion, the abundance of wood in the country is not considered by the inhabitants as an inconvenience, but the contrary. Indeed I have heard a native prince complain of a settlement made by some persons of a distant tribe in the inland part of his dominions, whom he should be obliged to expel from thence, in order to prevent the waste of his old woods. This seemed a superfluous act of precaution in an island which strikes the eye as one general, impervious, and inexhaustible forest.

Mode of clearing the ground.

On the approach of the dry monsoon (April and May) or in the course of it, the husbandman makes choice of a spot for his *ladang*, or plantation of upland rice, for that season, and marks it out. Here it must be observed that property in land depends upon occupancy, unless where fruit-bearing trees have been planted, and as there is seldom any determined boundary between the lands of neighbouring villages, such marks are rarely disturbed. Collecting his family and dependants he next proceeds to clear the ground. This is an undertaking of immense labour, and would seem to require herculean force, but it is effected by skill and perseverance. The work divides itself into two parts. The first (called *tebbas*, *menebbas*) consists in cutting down the brushwood, and rank vegetables, which are suffered to dry during an interval of a fortnight, or more or less, according to the fairness of the weather, before they proceed to the second operation (called *tebbang*, *menebbang*) of felling the large trees. Their tools, the *prang* and *billiong* (the former resembling a bill-hook, and the latter an imperfect adze) are seemingly inadequate to the task, and the saw is unknown in the country. Being regardless of the timber, they do not fell the tree near the ground, where the stem is

and drovers are in the practice of setting fire to that which grows on the plains, by the road-side, that the young shoots which thereupon shoot up, may afterwards supply food to their buffaloes.

is thick, but erect a stage, and begin to hew, or chop rather, at the height of ten or twelve, to twenty or thirty feet, where the dimensions are smaller (and sometimes much higher, taking off little more than the head) until it is sufficiently weakened to admit of their pulling it down with rattans made fast to the branches, instead of ropes.* And thus by slow degrees the whole is laid low. In some places, however, a more summary process is attempted. It may be conceived that in the woods the cutting down trees singly is a matter of much difficulty, on account of the twining plants which spread from one to the other and connect them strongly together. To surmount this, it is not an uncommon practice to cut a number of trees half-through, on the same side, and then fix upon one of great bulk, at the extremity of the space marked out, which they cut nearly through, and having disengaged it from these *lianes* (as they are termed in the western world) determine its fall in such a direction as may produce the effect of its bearing down by its prodigious weight all those trees which had been previously weakened for the purpose. By this much time and labour are saved, and the object being to destroy and not to save the timber, the rending or otherwise spoiling the stems is of no moment. I could never behold this devastation without a strong sentiment of regret. Perhaps the prejudices of a classical education taught me to respect those aged trees as the habitation or material frame of an order of sylvan deities, who were now deprived of existence by the sacrilegious hand of a rude, undistinguishing savage. But without having recourse to superstition, it is not difficult to account for such feelings on the sight of a venerable wood, old, to appearance, as the soil it stood on, and beautiful beyond what pencil can describe, annihilated for the temporary use of the space it occupied. It seemed a violation of nature, in the too arbitrary exercise of power. The timber, from its abundance, the smallness of consumption, and its distance in most cases from the banks of navigable rivers, by which means alone it could be transported to any distance, is of no value; and trees whose bulk, height, straightness of stem, and extent of limbs, excite the admiration of a traveller, perish indiscriminately. Some of the branches are lopped off, and when these, together with the underwood, are become

* A similar mode of felling is described in the "*Maison rustique de Cayenne.*"

come sufficiently arid, they are set fire to, and the country, for the space of a month or two, is in a general blaze and smoke, until the whole is consumed, and the ground effectually cleared. The expiring wood, benificent to its ungrateful destroyer, fertilizes for his use, by its ashes and their salts, the earth which it so long adorned.

Unseasonable wet weather at this period, which sometimes happens, and especially when the business is deferred till the close of the dry or south-east monsoon, whose termination is at best irregular, produces much inconvenience by the delay of burning, till the vegetation has had time to renew itself; in which case the spot is commonly abandoned; or, if partially burned, it is not without considerable toil that it can be afterwards prepared for sowing. On such occasions there are impostors ready to make a profit of the credulity of the husbandman who, like all others whose employments expose them to risks, are prone to superstition, by pretending to a power of causing or retarding rain. One of these will receive, at the time of burning the *ladangs*, a dollar or more from each family in the neighbourhood, under the pretence of insuring favourable weather for their undertaking. To accomplish this purpose, he abstains, or pretends to abstain, for many days and nights, from food and sleep, and performs various trifling ceremonies; continuing all the time in the open air. If he espies a cloud gathering, he immediately begins to smoke tobacco with great vehemence, walking about with a quick pace, and throwing the puffs towards it with all the force of his lungs. How far he is successful it is no difficult matter to judge. His skill, in fact, lies in chusing his time, when there is the greatest prospect of the continuance of fair weather in the ordinary course of nature: but should he fail, there is an effectual salvo. He always promises to fulfil his agreement with a *Deo volente* clause, and so attributes his occasional disappointments to the particular interposition of the deity. The cunning men who, in this and many other instances of conjuration, impose on the simple country people, are always Malayan adventurers, and not unfrequently priests. The planter whose labour has been lost by such interruptions, generally finds it too late in the season to begin on another *ladang*, and the ordinary resource for subsisting himself and family, is to seek a spot of *sawah* ground, whose cultivation is less dependant upon

upon accidental variations of weather. In some districts much confusion in regard to the period of sowing is said to have arisen from a very extraordinary cause. Anciently, say the natives, it was regulated by the stars, and particularly by the appearance (heliacal rising) of the *bintang baniak* or pleiades; but after the introduction of the Mahometan religion, they were induced to follow the returns of the *puasa* or great annual fast, and forgot their old rules. The consequence of this was obvious; for the lunar year of the *hejrah* being eleven days short of the sydereal or solar year, the order of the seasons was soon inverted; and it is only astonishing that its inaptness to the purposes of agriculture should not have been immediately discovered.

Sowing.

When the periodical rains begin to fall, which takes place gradually about October, the planter assembles his neighbours (whom he assists in turn), and with the aid of his whole family proceeds to sow his ground, endeavouring to complete the task in the course of one day. In order to ensure success, he fixes, by the priest's assistance, on a lucky day, and vows the sacrifice of a kid, if his crop should prove favourable; the performance of which is sacredly observed, and is the occasion of a feast in every family after harvest. The manner of sowing (*tūgal-menūgal*) is this. Two or three men enter the plantation, as it is usual to call the *padi*-field, holding in each hand sticks about five feet long and two inches diameter, bluntly pointed, with which, striking them into the ground as they advance, they make small, shallow holes, at the distance of about five inches from each other. These are followed by the women and elder children with small baskets containing the seed-grain (saved with care from the choicest of the preceding crop) of which they drop four or five grains into every hole, and passing on, are followed by the younger children, who with their feet (in the use of which the natives are nearly as expert as with their hands) cover them lightly from the adjacent earth, that the seed may not be too much exposed to the birds, which, as might be expected, often prove destructive foes. The ground, it should be observed, has not been previously turned up by any instrument of the hoe or plough kind, nor would the stumps and roots of trees remaining in it admit of the latter being worked; although employed under other circumstances, as will hereafter appear. If rain succeeds, the

the *padi* is above ground in four or five days; but by an unexpected run of dry weather, it is sometimes lost, and the field sowed a second time. When it has attained a month or six weeks' growth, it becomes necessary to clear it of weeds (*siang-menyiang*), which is repeated at the end of two months or ten weeks; after which the strength it has acquired is sufficient to preserve it from injury in that way. Huts are now raised in different parts of the plantation, from whence a communication is formed over the whole by means of rattans, to which are attached scare-crows, rattles, clappers, and other machines for frightening away the birds, in the contrivance of which they employ incredible pains and ingenuity; so disposing them that a child, placed in the hut, shall be able, with little exertion, to create a loud, clattering noise, to a great extent; and on the borders of the field are placed at intervals a species of windmill fixed on poles, which, on the unexperienced traveller, have an effect as terrible as those encountered by the knight of La Mancha. Such precautions are indispensable for the protection of the corn, when in the ear, against the numerous flights of the *pipi*, a small bird with a light brown body, white head, and bluish beak, rather less than the sparrow, which in its general appearance and habits it resembles. Several of these lighting at once upon a stalk of *padi*, and bearing it down, soon clear it of its produce, and thus, if unmolested, destroy whole crops.

At the time of sowing the *padi*, it is a common practice to sow also, in the interstices, and in the same manner, *jagong* or maiz, which growing up faster, and ripening before it (in little more than three months) is gathered without injury to the former. It is also customary to raise in the same ground a species of momordica, the fruit of which comes forward in the course of two months.

Reaping. The nominal time allowed from the sowing to the reaping of the crop is five lunar months and ten days; but from this it must necessarily vary with the circumstances of the season. When it ripens, if all at the same time, the neighbours are again summoned to assist, and entertained for the day: if a part only ripens first, the family begin to reap it, and proceed through the whole by degrees. In this operation, called *tuwei-menuwei* from

from the instrument used, they take off the head of corn (the term of "ear" not being applicable to the growth of this plant) about six inches below the grain, the remaining stalk or halm being left as of no value. The *tuwei* is a piece of wood about six inches long, usually of carved work, and about two inches diameter, in which is fixed lengthwise a blade of four or five inches, secured at the extremes by points bent to a right angle, and entering the wood. To this is added a piece of very small bamboo from two to three inches long, fixed at right angles across the back of the wood, with a notch for receiving it, and pinned through by a small peg. This bamboo rests in the hollow of the hand, one end of the piece of wood passing between the two middle fingers, with the blade outwards; the natives always cutting *from* them.[a] With this in the right hand, and a small basket slung over the left shoulder, they very expeditiously crop the heads of *padi* one by one, bringing the stalk to the blade with their two middle fingers, and passing them, when cut, from the right hand to the left. As soon as the left hand is full, the contents are placed in regular layers in the basket (sometimes tied up in a little sheaf), and from thence removed to larger baskets, in which the harvest is to be conveyed to the *dusun* or village, there to be lodged in the *tangkian* or barns, which are buildings detached from the dwelling-houses, raised like them from the ground, widening from the floor towards the roof, and well lined with boards or coolitcoy. In each removal care is taken to preserve the regularity of the layers, by which means it is stowed to advantage, and any portion of it readily taken out for use.

Low ground rice.

Sawahs are plantations of *padi* in low, wet ground, which, during the growth of the crop, in the rainy season between the months of October and March,[b] are for the most part overflowed to the depth of six inches or

[a] The inhabitants of *Menangkabau* are said to reap with an instrument resembling a sickle.

[b] In the Trans. of the Batavian Society the following mention is made of the cultivation of rice in Java. The *padi sawa* is sown in low, watered grounds, in the month of March, transplanted in April, and reaped in August. The *padi tipar* is sown in high, ploughed

or a foot, beyond which latter the water becomes prejudicial. Leve marshes, of firm bottom, under a moderate stratum of mud, and not liable to deep stagnant water, are the situations preferred; the narrower hollows, though very commonly used for small plantations, being more liable to accidents from torrents and too great depth of water, which the inhabitants have rarely industry enough to regulate to advantage by permanent embankments. They are not, however, ignorant of such expedients, and works are sometimes met with, constructed for the purpose, chiefly, of supplying the deficiency of rain to several adjoining *sawahs*, by means of sluices, contrived with no small degree of skill and attention to levels.

In new ground, after clearing it from the brushwood, reeds, and aquatic vegetables with which the marshes, when neglected are overrun, and burning them at the close of the dry season, the soil is, in the beginning of the wet, prepared for culture by different modes of working. In some places a number of buffaloes, whose greatest enjoyment consists in wading and rolling in mud, are turned in, and these by their motions contribute to give it a more uniform consistence, as well as enrich it by their dung. In other parts less permanently moist, the soil is turned up either with a wooden instrument between a hoe and a pick-axe, or with the plough, of which they use two kinds; their own, drawn by one buffalo, extremely simple, and the wooden share of it doing little more than scratch the ground to the depth of six inches; and one they have borrowed from the Chinese, drawn either with one or two buffaloes, very light, and the share more nearly resembling ours, turning the soil over as it passes, and making a narrow furrow. In *sawahs*, however, the surface has in general so little consistence, that no furrow is perceptible, and the plough does little more than loosen the stiff mud to some depth, and cut the roots of the grass and weeds, from which it is afterwards cleared by means of a kind of harrow or rake, being a thick plank

lands, in November, and reaped in March (earlier in the season than I could have supposed). When sown where woods have been recently cut down, or in the clefts of the hills (klooven van het gebergte) it is named *padi gaga*. Vol. 1. p. 27.

plank of heavy wood, with strong wooden teeth, and loaded with earth where necessary. This they contrive to drag along the surface, for the purpose, at the same time, of depressing the rising spots and filling up the hollow ones. The whole being brought as nearly as possible to a level, that the water may lie equally upon it, the *sawah* is, for the more effectual securing of this essential point, divided into portions nearly square or oblong (called *pīring*, which signifies a dish), by narrow banks raised about eighteen inches, and two feet wide. These drying become harder than the rest, confine the water, and serve the purpose of footways throughout the plantation. When there is more water in one division than another, small passages are cut through the dams, to produce an equality. Through these apertures water is also, in some instances, introduced from adjacent rivers or reservoirs, where such exist, and the season requires their aid. The innumerable springs and rivulets with which this country abounds, render unnecessary the laborious processes by which water is raised and supplied to the rice grounds in the western part of India, where the soil is sandy: yet still the principal art of the planter consists, and is required, in the management of this article; to furnish it to the ground in proper and moderate quantities, and to carry it off from time to time by drains; for if suffered to be long stagnant, it would occasion the grain to rot.

Transplantation.

Whilst the *sawahs* have been thus in preparation to receive the *padi*, a small, adjacent, and convenient spot of good soil has been chosen, in which the seed-grain is sown as thick as it can well lie on the ground, and is then often covered with layers of *lalang* (long grass, instead of straw) to protect the grain from the birds, and perhaps assist the vegetation. When it has grown to the height of from five to eight inches, or generally at the end of forty days from the time of sowing, it is taken up, in showery weather, and transplanted to the *sawah*, where holes are made four or five inches asunder to receive the plants. If they appear too forward, the tops are cropped off. A supply is at the same time reserved in the seed-plots to replace such as may chance to fail upon removal. These plantations, in the same manner as the *ladangs*, it is necessary to cleanse from weeds at least twice in the first two or three months; but no maiz or other seed is sown among the crop. When

the *padi* begins to form the ear, or to blossom, as the natives express it, the water is finally drawn off, and at the expiration of four months from the time of transplanting, it arrives at maturity. The manner of guarding against the birds is similar to what has been already described; but the low ground crop has a peculiar and very destructive enemy in the rats, which sometimes consume the whole of it, especially when the plantation has been made somewhat out of season; to obviate which evil, the inhabitants of a district sow by agreement pretty nearly at the same time; whereby the damage is less perceptible. In the mode of reaping, likewise, there is nothing different. Upon the conclusion of the harvest it is an indispensable duty to summon the neighbouring priests to the first meal that is made of the new rice, when an entertainment is given according to the circumstances of the family. Should this ceremony be omitted, the crop would be accursed (*haram*), nor could the whole household expect to outlive the season. This superstition has been by the Mahometans judiciously engrafted on the stock of credulity in the country people.

The same spot of low ground is for the most part used without regular intermission for several successive years, the degree of culture they bestow by turning up the soil, and the overflowing water, preserving its fertility. They are not, however, insensible to the advantage of occasional fallows. In consequence of this continued use the value of the *sawah* grounds differs from that of *ladangs*, the former being, in the neighbourhood of populous towns particularly, distinct property, and of regularly ascertained value. At Natal, for example, those containing between one and two acres sell for sixteen to twenty Spanish dollars. In the interior country, where the temperature of the air is more favourable to agriculture, they are said to sow the same spot with *ladang* rice for three successive years; and there also it is common to sow onions as soon as the stubble is burned off. Millet (*randa jawa*) is sown at the same time with the *padi*. In the country of *Manna*, southward of Bencoolen, a progress in the art of cultivation is discovered, superior to what appears in almost any other part of the island; the *Batta* country, perhaps, alone excepted. Here may be seen pieces of land in size from five to fifteen acres, regularly ploughed and harrowed. The difference is thus accounted

accounted for. It is the most populous district in that southern part, with the smallest extent of sea-coast. The pepper plantations and *ladangs* together having in a great measure exhausted the old woods in the accessible parts of the country, and the inhabitants being therein deprived of a source of fertility which nature formerly supplied, they must either starve, remove to another district, or improve by cultivation the spot where they reside. The first is contrary to the inherent principle that teaches man to preserve life by every possible means: their attachment to their native soil, or rather their veneration for the sepulchres of their ancestors, is so strong, that to remove would cost them a struggle almost equal to the pangs of death: necessity, therefore, the parent of art and industry, compels them to cultivate the earth. The produce of the grounds thus tilled is reckoned at thirty for one; from those in the ordinary mode about an hundred fold on the average, the *ladangs* yielding about eighty, and the *sawahs* an hundred and twenty. Under favourable circumstances I am assured the rate of produce is sometimes so high as an hundred and forty fold. The quantity sown by a family is usually from five to ten bamboo measures or gallons. These returns are very extraordinary compared with those of our wheat-fields in Europe, which, I believe, seldom exceed fifteen, and are often under ten. To what is this disproportion owing? to the difference of grain, as rice may be in its nature extremely prolific? to the more genial influence of a warmer climate? or to the earth's losing by degrees her fecundity, from an excessive cultivation? Rather than to any of these causes, I am inclined to attribute it to the different process followed in sowing. In England the saving of labour and promoting of expedition are the chief objects, and in order[a] to effect these, the grain is almost universally scattered in the furrows; excepting where the drill has been introduced. The Sumatrans, who do not calculate the value of their own labour or that of their domestics on such occasions, make holes in the ground, as has been described, and drop into each a few grains; or

Rate of produce.

[a] In an address from the Bath Agricultural Society, dated 12th October, 1795, it is strongly recommended to the cultivators of land (on account of the then existing scarcity of grain) to adopt the method of *dibbling* wheat. The holes to be made either by the common dibble, or

or by a process still more tedious, raise the seed in beds, and then plant it out. Mr. Charles Miller, in a paper published in the Phil. Trans. has shewn us the wonderful effects of successive transplantation. How far it might be worth the English farmer's while to bestow more labour in the business of sowing the grain, with the view of a proportionate increase in the rate of produce, I am not competent, nor is it to my present purpose, to form a judgment. Possibly as the advantage might be found to lie rather in the quantity of grain saved in the sowing, than gained in the reaping, it would not answer his purpose; for although half the quantity of seed-corn bears reciprocally the same proportion to the usual produce, that double the latter does to the usual allowance of seed, yet in point of profit the scale is different. To augment this, it is of much more importance to increase the produce from a given quantity of land, than to diminish the quantity of grain necessary for sowing it.

Fertility of soil.

Notwithstanding the received opinion of the fertility of what are called the Malay Islands, countenanced by the authority of M. Poivre and other celebrated writers, and still more by the extraordinary produce of grain, as above stated, I cannot help saying that I think the soil of the western coast of Sumatra is in general rather steril than rich. It is for the most part a stiff, red clay, burned nearly to the state of a brick, where it is exposed to the influence of the sun. The small proportion of the whole that is cultivated, is either ground from which old woods have been recently cleared, whose leaves had formed a bed of vegetable earth some inches deep, or else ravines into which the scanty mould of the adjoining hills has been washed by the annual torrents of rain. It is true, that in many parts of the coast there are, betweeen the cliffs and the sea-beach,

or with an implement having four or more points in a frame, at the distance of about four inches every way, and to the depth of an inch and half; dropping *two* grains into every hole. The man who dibbles is to move backwards, and to be followed by two or three women or children, who drop in the grains. A bush-hurdle, drawn across the furrows by a single horse, finishes the business. About six pecks of seed-wheat per acre are saved by this method. The expense of dibbling, dropping, and covering, is reckoned, in Norfolk, at about six shillings per acre. (Times Newspaper of 20th of October, 1795.)

sea-beach, plains varying in breadth and extent, of a sandy soil, probably left by the sea, and more or less mixed with earth in proportion to the time they have remained uncovered by the waters; and such are found to prove the most favourable spots for raising the productions of other parts of the world. But these are partial and insufficient proofs of fertility. Every person who has attempted to make a garden of any kind near Fort Marlborough, must well know how ineffectual a labour it would prove, to turn up with the spade a piece of ground adopted at random. It becomes necessary for this purpose to form an artificial soil of dung, ashes, rubbish, and such other materials as can be procured. From these alone he can expect to raise the smallest supply of vegetables for the table. I have seen many extensive plantations of coconut, *pinang*, lime, and coffee-trees, laid out at a considerable expense by different gentlemen, and not one do I recollect to have succeeded; owing, as it would seem, to the barrenness of the soil, although covered with long grass. These disappointments have induced the Europeans almost entirely to neglect agriculture. The more industrious Chinese colonists, who work the ground with indefatigable pains, and lose no opportunity of saving and collecting manure, are rather more successful; yet have I heard one of the most able cultivators among this people, who, by the dint of labour and perseverance, had raised what then appeared to me a delightful garden, designed for profit as well as pleasure, declare that his heart was almost broken in struggling against nature; the soil being so ungrateful, that instead of obtaining an adequate return for his trouble and expense, the undertaking was likely to render him a bankrupt; and which he would inevitably have been, but for assistance afforded him by the East India Company.[a] The natives, it is true, without much or any

Some particular plants, especially the *tea*, *Key Sūn* used to tell me he considered as his children: his first care in the morning, and his last in the evening, was to tend and cherish them. I heard with concern of his death soon after the first publication of this work, and could have wished the old man had lived to know that the above small tribute of attention had been paid to his merits as a gardener.

In a letter received from the late ingenious Mr. Charles Campbell, belonging to the medical establishment of Fort Marlborough, whose communications I shall have future occasion to

any cultivation raise several useful trees and plants; but they are in very small quantities, and immediately about their villages, where the ground is fertilized in spite of their indolence, by the common sweepings of their houses and streets and the mere vicinity of their buildings. I have often had occasion to observe, in young plantations, that those few trees which surrounded the house of the owner, or the hut of the keeper, considerably over-topped their brethren of the same age. Every person at first sight, and on a superficial view of the Malayan countries, pronounces them the favourites of nature, where she has lavished her bounties with a profusion unknown in other regions, and laments the infatuation of the people, who neglect to cultivate the finest soil in the world. But I have scarcely known one, who, after a few years' residence, has not entirely altered his opinion. Certain it is, that in point of external appearance they may challenge all others to comparison. In many parts of Sumatra, rarely trodden by human foot, scenes present themselves adapted to raise the sublimest sentiments in minds susceptible of the impression. But how rarely are they contemplated by minds of that temper! and yet it is alone

> "*For such the rivers dash their foaming tides,*
> The mountain swells, the vale subsides,
> The stately wood detains the wand'ring sight,
> And the rough barren rock grows pregnant with delight."

Even

to notice, he writes on the 29th of March, 1802, "I must not omit to say a word about my attempts to cultivate the land. The result of all my labours in that way was disappointment, almost as heart-breaking as that of the unlucky Chinaman; whose example, however, did not deter me. After many vexations, I descended from the plains into the ravines, and there met with the success denied me on the elevated land. In one of these, through which runs a small rivulet emptying itself into the lake of *Dusun Besár*, I attempted a plantation of coffee, where there are now upwards of seven thousand plants firmly rooted and putting out new leaves." This cultivation has since been so much increased, as to become an important article of commerce.

It should at the same time be acknowledged, that our acquaintance with the central and eastern parts of the island is very imperfect, and that much fertile land may be found beyond the range of mountains.

Even where there *are* inhabitants, to how little purpose, as it respects them, has she been profuse in ornament! In passing through places where my fancy was charmed with more luxuriant, wild, and truly picturesque views than I had ever before met with, I could not avoid regretting, that a country so captivating to the eye should be allotted to a race of people who seem totally insensible of its beauties. But it is time to return from this excursion, and pursue the progress of the husbandman through his remaining labours.

Different nations have adopted various methods of separating the grain from the ear. The most ancient we read of was that of driving cattle over the sheaves, in order to trample it out. Large planks; blocks of marble; heavy carriages, have been employed in later times for this end. In most parts of Europe the flail is now in use, but in England begins to be superseded by the powerful and expeditious, but complicated threshing-machine. The Sumatrans have a mode differing from all these. The bunches of *padi* in the ear being spread on mats, they rub out the grain between and under their feet; supporting themselves, in common, for the more easy performance of this labour, by holding with their hands a bamboo placed horizontally over their heads. Although, by going always unshod, their feet are extremely callous, and therefore adapted to the exercise, yet the workmen when closely tasked by their masters, sometimes continue shuffling till the blood issues from their soles. This is the universal practice throughout the island. Modes of threshing.

After treading out, or threshing, the next process is to winnow the corn, (*meñgīrei*), which is done precisely in the same manner as practised by us. Advantage being taken of a windy day, it is poured out from a sieve or fan; the chaff dispersing, whilst the heavier grain falls to the ground. This simple mode seems to have been followed in all ages and countries, though now giving place, in countries where the saving of labour is a principal object, to mechanical contrivances.

In order to clear the grain from the husk, by which operation the *padi* acquires the name of rice (*bras*), and loses one half of its measured quantity, two bamboos of the former yielding only one of the latter, it is first

spread out in the sunshine to dry (*jumūr*), and then pounded in large wooden mortars (*lesūng*), with heavy pestles (*alū*) made of a hard species of wood, until the outer coat is completely separated from it; when it is again fanned. This business falls principally to the lot of the females of the family, two of whom commonly work at the same mortar. In some places (but not frequently) it is facilitated by the use of a lever, to the end of which a short pestle or pounder is fixed; and in others by a machine which is a hollow cylinder or frustum of a cone, formed of heavy wood, placed upon a solid block of the same diameter, the contiguous surfaces of each being previously cut in notches or small grooves, and worked backwards and forwards, horizontally, by two handles or transverse arms; a spindle fixed in the centre of the lower cylinder serving as an axis to the upper or hollow one. Into this the grain is poured, and it is thus made to perform the office of the hopper, at the same time with that of the upper, or moveable stone, in our mills. In working, it is pressed downwards to increase the friction, which is sufficient to deprive the *padi* of its outer coating.

The rice is now in a state for sale, exportation, or laying up. To render it perfectly clean for eating, a point to which they are particularly attentive, it is put a second time into a *lesūng* of smaller size, and being sufficiently pounded without breaking the grains, it is again winnowed, by tossing it dexterously in a flat sieve, until the pure and spotless corns are separated from every particle of bran. They next wash it in cold water, and then proceed to boil it in the manner before described.

Rice as an article of trade.

As an article of trade, the Sumatran rice seems to be of a more perishable nature than that of some other countries, the upland rice not being expected to keep longer than twelve months, and the low-land shewing signs of decay after six. At *Natal* there is a practice of putting a quantity of the leaves of a shrub called *lagundi* (vitex trifolia) amongst it, in granaries, or the holds of vessels, on the supposition of its possessing the property of destroying or preventing the generation of weevils that usually breed in it. In Bengal, it is said, the rice intended for exportation is steeped in hot water, whilst still in the husk, and afterwards dried by exposure

exposure to the sun; owing to which precaution, it will continue sound for two or three years, and is on that account imported for garrison store at the European settlements. If retained in the state of *padi*, it will keep very long without damaging.[a] The country people lay it up unthreshed from the stalk, and beat it out (as we render their word *tumbuk*) from time to time as wanted for use or sale.

The price of this necessary of life differs considerably throughout the island, not only from the circumstances of the season, but according to the general demand at the places where it is purchased, the degree of industry excited by such demand, and the aptitude of the country to supply it. The northern parts of the coast, under the influence of the Achinese, produce large quantities; particularly *Susu* and *Tampat-tūan*, where it is (or used to be) purchased at the rate of thirty bamboos (gallons) for the Spanish dollar, and exported either to *Achin* or to the settlement of *Natal* for the use of the Residency of Fort Marlborough. At Natal also, and for the same ultimate destination, is collected the produce of the small island of *Nias*, whose industrious inhabitants, living themselves upon the sweet potatoe (convolvulus batatas) cultivate rice for exportation only, encouraged by the demand from the English and (what were) the Dutch factories. Not any is exported from Natal of its actual produce; a little from *Ayer Bunĝi*; more from the extensive but neglected districts of *Pasaman* and *Musang*, and many cargoes from the country adjacent to Padang. Our pepper settlements to the northward of Fort Marlborough, from *Moco Moco* to *Laye* inclusive, export each a small quantity, but from thence southward to *Kroï*, supplies are required for the subsistence of the inhabitants, the price varying from twelve to four bamboos, according to the season. At our head settlement the consumption of the civil and military establishments, the Company's *labourers*, together with the Chinese and Malayan settlers, so much exceeds the produce of the adjoining districts (although exempted from any obligation to cultivate pepper) that there is a necessity for importing a quantity from

[a] I have in my possession specimens of a variety of species which were transmitted to me twelve years ago, and are still perfectly sound.

from the islands of *Java* and *Bally*, and from Bengal, about three to six thousand bags annually.*

The rice called *pūlut* or *bras se-pūlut* (oryza gelatinosa) of which mention has been made in the list (p. 66) is in its substance of a very peculiar nature, and not used as common food, but with the addition of cocoanut kernel, in making a viscous preparation called *lemang* which I have seen boiled in a green bamboo, and other *juādahs* or friandises. It is commonly distinguished into the white, red, and black sorts, among which the red appears to be the most esteemed. The black chiefly is employed by the Chinese colonists at Batavia and Fort Marlborough in the composition of a fermented liquor called *bram* or *brum*, of which the basis is the juice extracted from a species of palm.

Cocoanut. The Cocoanut tree, *kalāpa*, *nīor* (cocos nucifera) may be esteemed the next important object of cultivation, from the uses to which its produce is applied; although by the natives of Sumatra it is not converted to such a variety of purposes as in the Maldives and those countries where nature has been less bountiful in other gifts. Its value consists principally in the kernel of the nut, the consumption of which is very great, being an essential ingredient in the generality of their dishes. From this also, but in a state of more maturity, is procured the oil in common use near the sea-coast, both for anointing the hair, in cookery, and for burning in lamps. In the interior country other vegetable oils are employed, and light is supplied by a kind of links made of *dammar* or resin. A liquor, commonly known in India by the name of toddy, is extracted from this as well as from other trees of the palm-kind. Whilst quite fresh it is sweet and pleasant to the taste, and is called *nīra*. After four and twenty hours it acidulates, ferments, and becomes intoxicating, in which state it is called *tūak*. Being distilled with molasses and other ingredients, it yields the spirit called arrack. In addition to these, but of trifling importance, are the cabbage or succulent pith at the head of the tree,

* This has reference to the period between 1770 and 1780, generally. So far as respects the natives there has been no material alteration.

tree, which, however, can be obtained only when it is cut down, and the fibres of the leaves, of which the natives form their brooms. The stem is never used for building, nor any carpenter's purposes, in a country where fine timber so much abounds. The fibrous substance of the husk is not there manufactured into cordage, as in the west of India, where it is known by the name of *coir;* rattans and *ējū* (a substance to be hereafter described), being employed for that purpose. The shell of the nut is but little employed as a domestic utensil, the lower class of people preferring the bamboo and the *labu* (cucurbita lagenaria); and the better sort being possessed of coarse china-ware. If the filaments surrounding the stem are any where manufactured into cloth, as has been asserted, it must be in countries that do not produce cotton, which is a material beyond all comparison preferable: besides that certain kind of trees, as before observed, afford, in their soft and pliable inner bark, what may be considered as a species of cloth ready woven to their hands.

This tree, in all its species, stages, fructification, and appropriate uses, has been so elaborately and justly described by many writers, especially the celebrated Rumphius, in his Herbarium Amboinense, and Van Rheede, in his Hortus Malabaricus, that to attempt it here would be an unnecessary repetition, and I shall only add a few local observations on its growth. Every *dusun* is surrounded with a number of fruit-bearing trees, and especially the coconut, where the soil and temperature will allow them to grow, and near the bazars or sea-port towns, where the concourse of inhabitants is in general much greater than in the country, there are always large plantations of them, to supply the extraordinary demand. The tree thrives best in a low, sandy soil, near the sea, where it will produce fruit in four or five years; whilst in the clayey ground it seldom bears in less than seven to ten years. As you recede from the coast the growth is proportionably slower, owing to the greater degree of cold among the hills; and it must attain there nearly its full height before it is productive, whereas in the plains a child can generally reach its first fruit from the ground. Here, said a countryman at *Laye*, if I plant a coconut, or *durian* tree, I may expect to reap the fruit of it; but in *Labun* (an inland district) I should only plant for my

my great-grandchildren. In some parts, where the land is particularly high, neither these, the betelnut, nor pepper-vines, will produce fruit at all.

It has been remarked by some writer, that the great date-bearing palm-tree, and the coconut, are never found to flourish in the same country. However this may hold good as a general assertion, it is a fact that not one tree of that species is known to grow in Sumatra, where the latter, and many others of the palm kind, so much abound. All the small low islands which lie off the western coast are skirted, near the sea-beach, so thickly with coconut trees, that their branches touch each other, whilst the interior parts, though not on a higher level, are entirely free from them. This, beyond a doubt, is occasioned by the accidental floating of the nuts to the shore, where they are planted by the hand of nature, shoot up, and bear fruit; which, falling when it arrives at maturity, causes a successive reproduction. Where uninhabited, as is the case with *Pulo Mēgo*, one of the southernmost, the nuts become a prey to the rats and squirrels; unless when occasionally disturbed by the crews of vessels, which go thither to collect cargoes for market on the main-land. In the same manner, as we are told by Flacourt,[a] they have been thrown upon the coast of Madagascar, and are not there indigenous; as I have been also assured by a native. Yet it appears that the natives call it *voaniou*, which is precisely the name by which it is familiarly known in Sumatra, being *būah-nīor;* the *v* being uniformly substituted for *b*, and *f* for *p*, in the numerous Malayan words occurring in the language of the former island. On the other hand, the singular production to which the appellation of sea-coconut (*kalāpa lāut*) has been given, and which is known to be the fruit of a species of *borassus* growing in one of the Séchelles Islands,[b] not far from Madagascar, are sometimes floated as far as the Malayan coasts, where they are supposed to be natives of the ocean, and were held in high veneration

[a] Histoire de l'isle Madagascar, p. 127.

[b] See a particular description of the sea-coconut, with plates, in the Voyage à la Nouvelle Guinée, par Sonnerat, p 3.

neration for their miraculous effects in medicine, until about the year 1772 a large cargo of them was brought to Bencoolen by a French vessel, when their character soon fell with their price.

The *pīnang* (areca catechu L.) or betel-nut tree (as it is usually, but improperly, called, the betel being a different plant) is in its mode of growth and appearance not unlike the coconut. It is, however, straighter in the stem, smaller in proportion to the height, and more graceful. The fruit, of which the varieties are numerous, (such as the *pinang betūl*, *pinang ambun*, and *pinang wangi*) is, in its outer-coat, about the size of a plumb; the nut, something less than that of the nutmeg, but rounder. This is eaten with the leaf of the *sīrih* or betel (piper betel L.) a climbing plant, whose leaf has a strong aromatic flavour, and other stimulating additions; a practice that shall be hereafter described. Of both of these the natives make large plantations. Pinang or betel-nut.

In respect to its numerous and valuable uses, the *bambu* or bamboo-cane (arundo bambos) holds a conspicuous rank amongst the vegetables of the island, though I am not aware that it is any where cultivated for domestic purposes, growing wild, in most parts, in great abundance. In the Batta country, and perhaps some other inland districts, they plant a particular species very thickly about their *kampongs* or fortified villages, as a defence against the attacks of an enemy; the mass of hedge which they form being almost impenetrable. It grows in common to the thickness of a man's leg, and some sorts to that of the thigh. The joints are from fifteen to twenty inches asunder, and the length about twenty to forty feet. In all manner of building it is the chief material, both in its whole state, and split into laths and otherwise, as has already appeared in treating of the houses of the natives; and the various other modes of employing it will be noticed either directly or incidentally in the course of the work. Bamboo.

The sugar-cane (*tubbu*) is very generally cultivated, but not in large quantities, and more frequently for the sake of chewing the juicy reed, which they consider as a delicacy, than for the manufacture of sugar. Yet this is not unattended to, for home consumption, especially in the northern Sugar-cane.

northern districts. By the Europeans and Chinese large plantations have been set on foot near Bencoolen, and worked from time to time with more or less effect; but in no degree to rival those of the Dutch at Batavia, from whence, in time of peace, the exportation of sugar (*gula*), sugar-candy (*gula batu*) and arrack, is very considerable. In the southern parts of the island, and particularly in the district of Manna, every village is provided with two or three machines, of a peculiar construction, for squeezing the cane; but the inhabitants are content with boiling the juice to a kind of sirop. In the *Lampong* country they manufacture from the liquor yielded by a species of palm-tree, a moist, clammy, imperfect kind of sugar, called *jaggri* in most parts of India.*

Jaggri. This palm, named in Sumatra *anau*, and by the eastern Malays *gomuto*, is the borassus gomutus of Loureiro, the saguerus pinnatus of the Batavian Transact. and the cleophora of Gærtner. Its leaves are long and narrow, and though naturally tending to a point, are scarcely ever found perfect, but always jagged at the end. The fruit grows in bunches of thirty or forty together, on strings three or four feet long, several of which hang from one shoot. In order to procure the *nīra* or toddy (held in higher estimation than that from the coconut-tree), one of these shoots for fructification is cut off a few inches from the stem, the remaining part is tied up and beaten, and an incision is then made, from which the liquor distils into a vessel or bamboo closely fastened beneath. This is replaced every twenty-four hours. The *anau* palm produces also (beside a little sago) the remarkable substance called *ījū* and *gomuto*, exactly resembling coarse black horse-hair, and used for making cordage of a very excellent kind, as well as for many other purposes, being nearly incorruptible. It encompasses the stem of the tree, and is seemingly bound to it by thicker fibres or twigs, of which the natives make pens for writing. Toddy is likewise procured from the *lontar* or borassus flabellifer, the *tala* of the Hindus.

Sago. The *Rambiya*, *pūhn sagu*, or proper sago tree, is also of the palm kind. Its

* This word is evidently the *shakar* of the Persians, the Latin *saccharum*, and our sugar.

Its trunk contains a farinaceous and glutinous pith, that being soaked, dried, and granulated, becomes the sago of our shops, and has been too frequently and accurately described (by Rumphius, in particular, Vol. I. ch. 17 and 18, and by M. Poivre) to need a repetition here.

The *nībong* (caryota urens), another species of palm, grows wild in such abundance, as not to need cultivation. The stem is tall, slender, and straight, and being of a hard texture on the outer part, it is much used for posts in building the slight houses of the country, as well as for paling of a stronger kind than the bamboo usually employed. Within-side it is fibrous and soft, and when hollowed out, being of the nature of a pipe, is well adapted to the purpose of gutters or channels to convey water. The cabbage, as it is termed, or pith at the head of the tree (the germ of the foliage) is eaten as a delicacy, and preferred to that of the coconut. Nibong.

The *nīpah*, (cocos nypa, Lour.) a low species of palm, is chiefly valuable for its leaves, which are much used as thatch for the roofs of houses. The pulpy kernels of the fruit (called *būah atap*) are preserved as a sweetmeat, but are entirely without flavour. Nipah.

The *pāku bīndu* (cycas circinalis) has the general appearance of a young, or rather dwarf coconut-tree, and like that and the *nībong* produces a cabbage that is much esteemed as a culinary vegetable. The tender shoots are likewise eaten. The stem is short and knobby, the lower part of each branch (if branches they may be called) prickly, and the blossom yellow. The term *pāku*, applied to it by the Malays, shews that they consider it as partaking of the nature of the fern (filix), and Rumphius, who names it *sayor calappa* and olus calappoides, describes it as an arborescent species of osmunda. It is well depicted in Vol. I. tab. 22. Cycas.

The maiz or Turkey-corn (zea mays), called *jagong*, though very generally sown, is not cultivated in quantities as an article of food, excepting in the Batta country. The ears are plucked whilst green, and, being slightly roasted on the embers, are eaten as a delicacy. Chili or Maiz.

Cayenne pepper (capsicum), called improperly *lāda panjang* or long pepper, and also *lāda mērah*, red pepper, which, in preference to the common or black pepper, is used in their curries and with almost every article of their food, always finds a place in their irregular and inartificial gardens. To these, indeed, their attention is very little directed, in consequence of the liberality with which nature, unsolicited, supplies their wants. Turmeric (curcuma) is a root of general use. Of this there are two kinds, the one called *kūnyit mérah*, an indispensable ingredient in their curries, pilaws, and sundry dishes; the other, *kūnyit tummu* (a variety with coloured leaves, and a black streak running along the mid-rib) is esteemed a good yellow dye, and is sometimes employed in medicine. Ginger (amomum zinziber) is planted in small quantities. Of this, also, there are two kinds, *alīa jāi* (zinziber majus), and *alīa padas* (zinziber minus), familiarly called *se-padē* or *se-puddē*, from a word signifying that pungent, acrid, taste in spices, which we express by the vague term "hot." The *tummu* (costus arabicus), and *lampuyang* (amomum zerumbet), are found both in the wild and cultivated state, being used medicinally; as is also the galangale (kæmpferia galanga). The coriander, called *katumbar*, and the cardamum, *pūah lako*, grow in abundance. Of the *pūah* (amomum) they reckon many species, the most common of which has very large leaves, resembling those of the plantain and possessing an aromatic flavour not unlike that of the bay tree. The *jintan* or cumin-seed (cuminum) is sometimes an ingredient in curries. Of the *Moruñggei* or *kelor* (guilandina moringa L. hyperanthera moringa Wilden.), a tall shrub with pinnated leaves, the root has the appearance, flavour, and pungency of the horse-radish, and the long pods are dressed as a culinary vegetable; as are also the young shoots of the *priñggi* (cucurbita pepo), various sorts of the *lapang* or cucumber, and of the *lobak* or radish. The *inei* or *henna* of the Arabians (lawsonia inermis) is a shrub with small light-green leaves, yielding an expressed juice, with which the natives tinge the nails of their hands and feet. *Ampalas* (delima sarmentosa and ficus ampelos) is a shrub whose blossom resembles that of our hawthorn in appearance and smell. Its leaf has an extraordinary roughness, on which account it is employed to give the last fine polish to carvings in wood and ivory, particularly the handles and sheaths of their krises, on which they bestow much labour. The

leaf

leaf of the *sīpīt* also, a climbing species of fig, having the same quality, is put to the same use. *Ganja* or hemp (cannabis) is extensively cultivated, not for the purpose of making rope, to which they never apply it, but to make an intoxicating preparation, called *bang*, which they smoke in pipes along with tobacco. In other parts of India a drink is prepared by bruising the blossoms, young leaves, and tender parts of the stalk. Small plantations of tobacco, which the natives call *tambaku*, are met with in every part of the country. The leaves are cut, whilst green, into fine shreds, and afterwards dried in the sun. The species is the same as the Virginian, and were the quantity increased, and people more expert in the method of curing it, a manufacture and trade of considerable importance might be established.

Pulas twine.

The *kaluwi* is a species of urtica or nettle, of which excellent twine, called *pulas*, is made. It grows to the height of about four feet, has a stem imperfectly ligneous, without branches. When cut down, dried, and beaten, the rind is stripped off, and then twisted as we do the hemp. It affords me great satisfaction to learn that the manufacture of rope from this useful plant has lately attracted the attention of the Company's Government, and that a considerable nursery of the *kaluwi* has been established in the Botanic Garden at Calcutta, under the zealous and active management of Dr. Roxburgh, who expresses his opinion, that so soon as a method shall be discovered of removing a viscid matter found to adhere to the fibres, the *kaluwi* hemp, or *pulas*, will supersede every other material. The *bagu tree* (gnetum gnemon, L.) abounds on the southern coast of the island, where its bark is beaten, like hemp, and the twine manufactured from it is employed in the construction of large fishing nets. The young leaves of the tree are dressed in curries. In the island of *Nīas* they make a twine of the *baru* tree (hibiscus tiliaceus), which is afterwards woven into a coarse cloth for bags. From the *pīsang* (musa) a kind of sewing-thread is procured by stripping filaments from the mid-ribs of the leaves as well as from the stem. In some places this thread is worked in the loom. The *kratau*, a dwarf species of mulberry (morus, foliis profunde incisis) is planted for the food of the silk-worms, which they rear, but not to any great extent, and the raw silk produced from them seems of but an indifferent quality. The samples I have seen

were white instead of yellow, in large, flat cakes, which would require much trouble to wind off, and the filaments appeared coarse; but this may be partly occasioned by the method of loosening them from the bags, which is by steeping them in hot water. *Jarak* (ricinus and palma christi) from whence the castor oil is extracted, grows wild in abundance, especially near the sea-shore. *Bijin* (sesamum indicum) is sown extensively in the interior districts, for the oil it produces, which is there used for burning, in place of the coconut-oil so common near the coast.

Elastic gum. In the description of the urceola elastica, or *caout-chouc* vine, of Sumatra and *Pulo-Pinang*, by Dr. W. Roxburgh, in the Asiat. Res. Vol. V. p. 167, he says, " For the discovery of this useful vine, we are, I believe, indebted to Mr. Howison, late surgeon at *P. Pinang*; but it would appear he had no opportunity of determining its botanical character. To Dr. Charles Campbell, of Fort Marlborough, we owe the gratification arising from a knowledge thereof. About twelve months ago I received from that gentleman, by means of Mr. Fleming, very complete specimens, in full foliage, flower, and fruit. From these I was enabled to reduce it to its class and order in the Linnæan system. It forms a new genus immediately after tabernæmontana, and consequently belongs to the class called contortæ. One of the qualities of the plants of this order is, their yielding, on being cut, a juice which is generally milky, and for the most part deemed of a poisonous nature." Of another plant, producing a similar substance, I received the following information from Mr. Campbell, in a letter dated in November, 1803: " You may remember a trailing plant with a small yellowish flower, and a seed vessel of an oblong form, containing one seed; the whole plant resembling much the caout-chouc. To this, finding it wholly non-descript, I have taken the liberty to attach your name. It has no relationship to a genus yielding a similar substance, of which I sent a specimen to Dr. Roxburgh at Bengal, who published an account of it under the name of urceola. It is called *jintan* by the Malays, and of its three species I have accurately ascertained two, the *jintan itam* and *jintan burong*, the latter very rare. Its leaves are of a deep glossy green, and the flowers lightly tinged with a pale yellow; it belongs to the tetrandria, and is a handsome plant—but more of this with the drawing." Unfortunately, however,

however, neither this drawing, nor any part of his valuable collection of materials for improving the natural history of that interesting country, which he bequeathed to me by his will, have yet reached my hands.

Mr. Charles Miller observed in the country, near Bencoolen, a gum exuding spontaneously from the *paty* tree, which appeared very much to resemble the gum-arabic; and as they belong to the same genus of plants, he thought it not improbable that this gum might be used for the same purposes. In the list of new species by F. Norona (Batav. Trans. Vol. V.) he gives to the *petè* of Java the name of acacia gigantea; which I presume to be the same plant. Gum.

Kachang is a term applied to all sorts of pulse, of which a great variety is cultivated; as the *kachang chīna* (dolichos sinensis), *kachang putih* (dolichos katjang), *k. ka-karah* (d. lignosus), *k. kechil* (phaseolus radiatus), *k. ka-karah gatal* (dolichos pruriens) and many others. The *kachang tanah* (arachis hypogæa) is of a different class, being the granulose roots (or, according to some, the self-buried pods) of an herb with a yellow, papilionaceous flower, the leaves of which have some resemblance to the clover, but double only, and like it, affords rice pasture for cattle. The seeds are always eaten fried or parched, from whence they obtain their common appellation of *kachang goring*. Pulse.

The variety of roots of the yam and potatoe kind, under the general name of *ūbī*, is almost endless; the dioscorea being generally termed *ūbī kechil* (small), and the convolvulus, *ūbī gadáng* (large); some of which latter, of the sort called at Bencoolen the China yam, weigh as much as forty pounds, and are distinguished into the white and the purple. The fruit of the *trong* (melongena), of which the egg-plant is one species, is much eaten by the natives, split and fried. They are commonly known by the name of *brinjals*, from the *beringélhas* of the Portuguese. Yams.

Tārūm or indigo (indigofera tinctoria) being the principal dye-stuff they employ, the shrub is always found in their planted spots; but they do not manufacture it into a solid substance, as is the practice elsewhere. The stalks and branches having lain for some days in water to soak and macerate, Dye-stuffs. Indigo.

macerate, they then boil it, and work among it with their hands a small quantity of *chunam* (quick lime, from shells), with leaves of the *paku sabba* (a species of fern) for fixing the colour. It is afterwards drained off, and made use of in the liquid state.

There is another kind of indigo, called in Sumatra *tārūm akar*, which appears to be peculiar to that country, and was totally unknown to botanists to whom I shewed the leaves upon my return to England in the beginning of the year 1780. The common kind is known to have small pinnated leaves growing on stalks imperfectly ligneous. This, on the contrary, is a vine, or climbing plant, with leaves from three to five inches in length, thin, of a dark green, and in the dried state discoloured with blue stains. It yields the same dye as the former sort; they are prepared also in the same manner, and used indiscriminately, no preference being given to the one above the other, as the natives informed me; excepting inasmuch as the *tārūm akar*, by reason of the largeness of the foliage, yields a greater proportion of sediment. Conceiving it might prove a valuable plant in our colonies, and that it was of importance in the first instance that its identity and class should be accurately ascertained, I procured specimens of its fructification, and deposited them in the rich and extensively useful collection of my friend Sir Joseph Banks. In a paper on the Asclepiadeæ, highly interesting to botanical science, communicated by Mr. Robert Brown (who has lately explored the vegetable productions of New Holland and other parts of the East) to the Wernerian Society of Edinburgh, and printed in their Transactions, he has done me the honour of naming the genus to which this plant belongs, MARSDENIA, and this particular species *Marsdenia tinctoria*.*

Kasumba. Under the name of *kasumba* are included two plants yielding materials for dying, but very different from each other. The *kasumba* (simply) or *kasumba*

* "2. M. caule volubili, foliis cordatis ovato-oblongis acuminatis glabriusculis basi anticè glandulosis, thyrsis lateralibus, fauce barbatâ. Tarram akkar Marsd. Sumat. p. 78, edit. 2d. Hab. In insula Sumatra. (v. s. in Herb. Banks.)

kasumba jawa, as it is sometimes called, is the *carthamus tinctorius*, of which the flowers are used to produce a saffron colour, as the name imports. The *kasumba kling* or *galuga* is the *bixa orellana*, or arnotto of the West Indies. Of this the capsule, about an inch in length, is covered with soft prickles or hair, opens like a bivalve shell, and contains in its cavities a dozen or more seeds, the size of grape-stones, thickly covered with a reddish farina, which is the part that constitutes the dye.

Sapang, the Brazil-wood, (*cæsalpinia sappan*), whether indigenous or not, is common in the Malayan countries. The heart of this being cut into chips, steeped for a considerable time in water, and then boiled, is used for dying here, as in other countries. The cloth or thread is repeatedly dipped in this liquid, and hung to dry between each wetting, till it is brought to the shade required. To fix the colour, alum is added in the boiling.

Of the tree called *baṅgkūdu* in some districts, and in others *maṅgkūdu* (morinda umbellata) the outward parts of the root, being dried, pounded, and boiled in water, afford a red dye; for fixing which, the ashes procured from the stalks of the fruit and midribs of the leaves of the coconut are employed. Sometimes the bark or wood of the *sapang* tree is mixed with these roots. It is to be observed that another species of *baṅgkūdu*, with broader leaves (morinda citrifolia) does not yield any colouring matter; but is, as I apprehend, the tree commonly planted in the Malayan peninsula and in *Pulo Pinang*, as a support to the pepper vine.

Ubar is a red wood resembling the logwood (*hæmatoxylon*) of Hondu- Red wood.
ras, and might probably be employed for the same purpose. It is used by the natives in tanning twine for fishing nets, and appears to be the *ckir* or tanarius major of Rumph. Vol. III. p. 192. and jambolifera reziноso of Lour. Fl. C. C. p. 231. Their black dye is commonly made from the coats of the mangostin fruit and of the *kataping* (terminalia catappa). With this the blue cloth from the west of India is changed to a black, as usually worn by the Malays of *Menaṅgkabau*. It is said to be steeped in mud in order to fix the colour.

The

The roots of the *chapada* or *champadak* (artocarpus integrifolia) cut into chips and boiled in water produce a yellow dye. To strengthen the tint, a little turmeric (the *kūnyit tumma* or variety of curcuma already spoken of) is mixed with it, and alum to fix it; but as the yellow does not hold well, it is necessary that the operation of steeping and drying should be frequently repeated.

Fruits,

Fruits, Flowers, Medicinal Shrubs and Herbs.

NATURE, says a celebrated writer,* seems to have taken a pleasure in assembling in the Malayan countries her most favourite productions; and with truth I think it may be affirmed, that no region of the earth can boast an equal abundance and variety of indigenous fruits; for although the whole of those hereafter enumerated cannot be considered as such, yet there is reason to conclude that the greater part may; for the natives, who never appear to bestow the smallest labour in improving or even in cultivating such as they naturally possess, can hardly be suspected of taking the pains to import exotics. The larger number grow wild, and the rest are planted in a careless, irregular manner about their villages. Fruits.

The mangustin, called by the natives *mañgis* and *mañgista* (garcinia mangostana, L.) is the pride of these countries, to which it exclusively belongs, and has, by general consent, obtained, in the opinion of Europeans, the pre-eminence amongst Indian fruits. Its characteristic quality is extreme delicacy of flavour, without being rich or luscious. It is a drupe of a brownish red colour, and the size of a common apple, consisting of a thick rind, somewhat hard on the outside, but soft and succulent within, encompassing kernels which are covered with a juicy and Mangustin.

* "Les terres possédées par les Malais, sont en général de très-bonne qualité. La nature semble avoir pris plaisir d'y placer ses plus excellentes productions. On y voit tous les fruits délicieux que j'ai dit se trouver sur le territoire de Siam, et une multitude d'autres fruits agréables qui sont particuliers à ces isles." "On y respire un air embaumé par une multitude de fleurs agréables qui se succédent toute l'année, et dont l'odeur suave pénétre jusqu' à l'ame, et inspire la volupté la plus seduisante. Il n'est point de voyageur qui en se promenant dans les campagnes de Malacca, ne se sente invité à fixer son séjour dans un lieu si plein d'agrémens, dont la nature seule a fait tous les frais."

Voyages d'un Philosophe, par M. Poivre, p. 56.

and perfectly white pulp, which is the part eaten, or, more properly, sucked, for it dissolves in the mouth. Its qualities are as innocent as they are grateful, and the fruit may be eaten in any moderate quantity without danger of surfeit, or other injurious effects. The returns of its season appeared to be irregular, and the periods short.

Durian. The *durian* (durio zibethinus) is also peculiar to the Malayan countries. It is a rich fruit, but strong, and even offensive, in taste as well as smell, to those who are not accustomed to it, and of a very heating quality; yet the natives (and others who fall into their habits) are passionately addicted to it, and during the time of its continuing in season live almost wholly upon its luscious and cream-like pulp; whilst the rinds, thrown about in the bazars, communicate their scent to the surrounding atmosphere. The tree is large and lofty; the leaves are small in proportion, but in themselves long and pointed. The blossoms grow in clusters on the stem and larger branches. The petals are five, of a yellowish white, surrounding five branches of stamina, each bunch containing about twelve, and each stamen having four antheræ. The pointal is knobbed at top. When the stamina and petal fall, the empalement resembles a fungus, and nearly in shape, a Scot's bonnet. The fruit is in its general appearance not unlike the bread-fruit, but larger, and its coat is rougher.

Bread-fruit. The *sukan kapas*, and *sukun biji* or *kalawi*, are two species of the bread-fruit tree (artocarpus incisa). The former is the genuine, edible kind, without kernels, and propagated by cuttings of the roots. Though by no means uncommon, it is said not to be properly a native of Sumatra. The *kalawi*, on the contrary, is in great abundance, and its bark supplies the country people with a sort of cloth for their working dresses. The leaves of both species are deeply indented, like those of the fig, but considerably longer. The bread-fruit is cut in slices, and, being boiled or broiled on the fire, is eaten with sugar, and much esteemed. It cannot, however, be considered as an article of food, and I suspect that in quality it is inferior to the bread-fruit of the South-Sea Islands.

Jack-fruit. The Malabaric name of *jacca*, or the jack-fruit, is applied both to

the *champadak* or *chapada* (artocarpus integrifolia, L. and polyphema jaca, Lour.) and to the *nangka* (artocarpus integrifolia, L. and polyphema champeden, Lour). Of the former the leaves are smooth and pointed; of the latter they are roundish, resembling those of the Cashew. This is the more common, less esteemed, and larger fruit, weighing, in some instances, fifty or sixty pounds. Both grow in a peculiar manner from the stem of the tree. The outer coat is rough, containing a number of seeds or kernels (which, when roasted, have the taste of chesnuts) inclosed in a fleshy substance, of a rich, and to strangers too strong smell and flavour, but which gains upon the palate. When the fruit ripens, the natives cover it with mats, or the like, to preserve it from injury by the birds. Of the viscous juice of this tree they make a kind of bird-lime: the yellow wood is employed for various purposes, and the root yields a dye-stuff.

The mango, called *mañgga* and *mampalam* (mangifera indica, L.) is well known to be a rich, high-flavoured fruit of the plumb kind, and is found here in great perfection; but there are many inferior varieties, beside the *ambachang*, or mangifera fœtida, and the *tais*. Mango.

Of the *jambu* (eugenia, L.) there are several species, among which the *jambu merah* or *kling* (eug. malaccensis) is the most esteemed for the table, and is also the largest. In shape it has some resemblance to the pear, but is not so taper near the stalk. The outer skin, which is very fine, is tinged with a deep and beautiful red, the inside being perfectly white. Nearly the whole substance is edible, and when properly ripe it is a delicious fruit; but otherwise, it is spongy and indigestible. In smell, and even in taste, it partakes much of the flavour of the rose; but this quality belongs more especially to another species, called *jambu ayer mawar*, or the rose-water *jambu*. Nothing can be more beautiful than the blossoms, the long and numerous stamina of which are of a bright pink colour. The tree grows in a handsome, regular, conical shape, and has large, deep-green, pointed leaves. The *jambu ayer* (eugenia aquea) is a delicate and beautiful fruit in appearance, the colour being a mixture of white and pink; but in its flavour, which is a faint, agreeable acid, it does not equal the *jambu merah*. Jambu.

Plantain. Of the *pisang*, or plantain (musa paradisiaca, L.) the natives reckon above twenty varieties, including the banana of the West Indies. Among these the *pisang amas*, or small yellow plantain, is esteemed the most delicate; and next to that the *pisang raja*, *pisang diñgen*, and *pisang kallé*.

Pine-apple. The *nanas*, or pine-apple (bromelia ananas), though certainly not indigenous, grows here in great plenty with the most ordinary culture. Some think them inferior to those produced from hot-houses in England; but this opinion may be influenced by the smallness of their price, which does not exceed two or three pence. With equal attention, it is probable, they might be rendered much superior, and their variety is considerable. The natives eat them with salt.

Oranges. Oranges (*limau manis*) of many sorts, are in the highest perfection. That called *limau japūn*, or Japan orange, is a fine fruit, not commonly known in Europe. In this the cloves adhere but slightly to each other, and scarcely at all to the rind, which contains an unusual quantity of the essential oil. The *limau gadáng*, or pumple-nose (citrus aurantium), called in the West Indies the shaddock (from the name of the captain who carried them thither), is here very fine, and distinguished into the white and red sorts. Limes or *limau kapas*, and lemons, *limau kapas panjang*, are in abundance. The natives enumerate also the *limau lañgga*, *limau kambing*, *limau pīpit*, *limau sindi masam*, and *limau sindi manis*. The true citron, or *limau karbau*, is not common, nor in esteem.

Guava. The guava (psidium pomiferum) called *jambu biji*, and also *jambu protukal* (for Portugal, in consequence, as we may presume, of its having been introduced by the people of that country), has a flavour which some admire, and others equally dislike. The pulp of the red sort is sometimes mixed with cream by Europeans, to imitate strawberries, from a fond partiality to the productions of their native soil; and it is not unusual, amidst a profusion of the richest eastern fruits, to sigh for an English codling or gooseberry.

Custard-apple. The *siri kaya*, or custard-apple (annona squamosa), derives its name from

from the likeness which its white and rich pulp bears to a custard, and it is accordingly eaten with a spoon. The *nona*, as it is called by the natives (annona reticulata), is another species of the same fruit, but not so grateful to the taste.

The *kaliki*, or papaw (carica papaja), is a large, substantial, and wholesome fruit, in appearance not unlike a smooth sort of melon, but not very highly flavoured. The pulp is of a reddish yellow, and the seeds, which are about the size of grains of pepper, have a hot taste like cresses. The water-melon, called here *samangka* (cucurbita citrullus) is of very fine quality. The rock, or musk melons, are not common. Papaw.

Tamarinds, called *asam jawa*, or the Javan acid, are the produce of a large and noble tree, with small pinnated leaves, and supply a grateful relief in fevers, which too frequently require it. The natives preserve them with salt, and use them as an acid ingredient in their curries and other dishes. It may be remarked, that in general they are not fond of sweets, and prefer many of their fruits whilst green, to the same in their ripe state. Tamarind.

The *rambutan* (nephelium lappaceum, L. Mant.) is in appearance not much unlike the fruit of the arbutus, but larger, of a brighter red, and covered with coarser hair or soft spines, from whence it derives its name. The part eaten is a gelatinous and almost transparent pulp surrounding the kernel, of a rich and pleasant acid. Rambutan.

The *lansch*, likewise but little known to botanists, is a small, oval fruit, of a whitish brown colour, which, being deprived of its thin outer coat, divides into five cloves, of which the kernels are covered with a fleshy pulp, subacid, and agreeable to the taste. The skin contains a clammy juice, extremely bitter, and, if not stripped with care, it is apt to communicate its quality to the pulp. M. Corréa de Serra, in les Annales du Mus. d' Hist. Nat. Tom. X. p. 157. pl. 7. has given a description of the lansium domésticum, from specimens of the fruit preserved in the collection of Sir Joseph Banks. The *chupak*, *ayer-ayer*, and *rambé* are species or varieties of the same fruit. Lansch.

Of

Blimbing. Of the *blimbing* (averrhoa carambola) a pentagonal fruit, containing five flattish seeds, and extremely acid, there are two sorts, called *penjuru* and *besi*. The leaves of the latter are small, opposite, and of a sap-green; those of the former grow promiscuously, and are of a silver green. There is also the *blimbing bulu* (averrhoa billimbi), or smooth species. Their uses are chiefly in cookery, and for purposes where a strong acid is required, as in cleaning the blades of their krises and bringing out the damask, for which they are so much admired. The *cheremi* (averrhoa acida) is nearly allied to the *blimbing besi*, but the fruit is smaller, of an irregular shape, growing in clusters close to the branch, and containing each a single hard seed or stone. It is a common substitute for our acid fruits in tarts.

Kataping. The *kataping* (terminalia catappa, L. and juglans catappa, Lour.) resembles the almond both in its outer husk and the flavour of its kernel; but instead of separating into two parts, like the almond, it is formed of spiral folds, and is developed somewhat like a rose-bud, but continuous, and not in distinct laminæ.

Species of chesnut. The *baraŋ̃gan* (a species of fagus) resembles the chesnut. The tree is large, and the nuts grow sometimes one, two, and three in a husk. The *jerring*, a species of mimosa, resembles the same fruit, but is larger and more irregularly shaped than the *baraŋ̃gan*. The tree is smaller. The *tapus* (said to be a new genus belonging to the tricoccæ) has likewise some analogy, but more distant, to the chesnut. There are likewise three nuts in one husk, forming in shape an oblong splieroid. If eaten unboiled, they are said to inebriate. The tree is large.

Kamiling. The fruit named *kamĩri*, *kamĩling*, and more commonly *buah kras*, or the hard fruit (camirium cordifolium, Gært. and juglans camirium, Lour.) bears much resemblance to the walnut in the flavour and consistence of the kernel; but the shell is harder, and does not open in the same manner. The natives of the hills make use of it as a substitute for the coconut, both in their cookery, and for procuring a delicate oil.

Rattan. The *rotan salak* (calamus zalacca, Gært.) yields a fruit, the pulp of which

which is sweetish, acidulous, and pleasant. Its outer coat, like those of the other *rotans*, is covered with scales, or the appearance of nice basket-work. It incloses sometimes one, two, and three kernels, of a peculiar horny substance.

The cashew-apple and nut, called *jambu muniet*, or monkey-jambu (anacardium occidentale), are well known for the strong acidity of the former, and the caustic quality of the oil contained in the latter, from tasting which the inexperienced often suffer. Cashew.

The pomegranate or *dalima* (punica granatum) flourishes here, as in all warm climates. Pomegranate.

Grape-vines are planted with success by Europeans for their tables, but not cultivated by the people of the country. There is found in the woods a species of wild grape, called *priñgat* (vitis indica); and also a strawberry, the blossom of which is yellow, and the fruit has little flavour. Beside these there are many other, for the most part wild fruits, of which some boast a fine flavour, and others are little superior to our common berries, but might be improved by culture. Such are the *buah kandis*, a variety of *garcinia* (it should be observed that *buah*, signifying fruit, is always prefixed to the particular name), *buah malaka* (phyllanthus emblica), *rukam* (carissa spinarum), *bañgkudu* or *mañgkudu* (morinda citrifolia), *sikaduduk* (melastoma), *kitapan* (callicarpa japonica). Grapes, &c.

"You breathe in the country of the Malays (says the writer before quoted) an air impregnated with the odours of innumerable flowers of the greatest fragrance, of which there is a perpetual succession throughout the year, the sweet flavour of which captivates the soul, and inspires the most voluptuous sensations." Although this luxurious picture may be drawn in too warm tints, it is not, however, without its degree of justness. The people of the country are fond of flowers in the ornament of their persons, and encourage their growth, as well as that of various odoriferous shrubs and trees. Flowers.

The *kananga* (uvaria cananga, L.) being a tree of the largest size, surpassed Kananga.

passed by few in the forest, may well take the lead, on that account, in a description of those which bear flowers. These are of a greenish yellow, scarcely distinguishable from the leaves, among which the bunches hang down in a peculiar manner. About sun-set, if the evening be calm, they diffuse a fragrance around that affects the sense at the distance of some hundred yards.

Champaka. *Champaka* (michelia champaca). This tree grows in a regular, conical shape, and is ornamental in gardens. The flowers are a kind of small tulip, but close and pointed at top; their colour a deep yellow; the scent strong, and at a distance agreeable. They are wrapped in the folds of the hair, both by the women, and by young men who aim at gallantry.

Tanjong. *Buñga tanjong* (mimusops elengi, L.) A fair tree, rich in foliage, of a dark green; the flowers small, radiated, of a yellowish white, and worn in wreaths by the women; their scent, though exquisite at a distance, is too powerful when brought nigh. The fruit is a drupe, containing a large, blackish, flatted seed.

Gardenia. *Sañgklapa* (gardenia flore simplice). A handsome shrub with leaves of very deep green, long-pointed; the flowers a pure white, without visible stamina or pistil, the petals standing angularly to each other. It has little or no scent. The *pachah-pīring* (gardenia florida, described by Rumph. under the name of *catsjopiri*) is a grand, white, double flower, emitting a pleasing and not powerful odour.

Hibiscus. The *buñga rāya* (hibiscus rosa sinensis) is a well-known shrub, with leaves of a yellowish green, serrated and curled. Of one sort the flower is red, yielding a juice of deep purple, and when applied to leather produces a bright black; from whence its vulgar name of the shoe-flower. Of another sort the blossom is white. They are without smell.

Plumeria. *Buñga* or *kumbang kamboja* (plumeria obtusa) is likewise named *buñga kubūr-an*, from its being always planted about graves. The flower is large, white, yellow towards the centre, consisting of five simple, smooth, thick

thick petals, without visible pistil or stamina, and yielding a strong scent. The leaf of the tree is long, pointed, of a deep green, remarkable in this, that round the fibres proceeding from the midrib run another set near the edge, forming a handsome border. The tree grows in a stunted, irregular manner, and even whilst young has a venerable, antique appearance.

The *buñga malāti* and *buñga malur* (nyctanthes sambac) are different names for the same humble plant, called *mugri* in Bengal. It bears a pretty, white flower, diffusing a more exquisite fragrance, in the opinion of most persons, than any other of which the country boasts. It is much worn by the females; sometimes in wreaths, and various combinations, along with the *buñga tanjong*, and frequently the unblown buds are strung in imitation of rows of pearls. It should be remarked, that the appellative *buñga*, or flower, (pronounced *buñgo* in the south-western parts of Sumatra), is almost ever prefixed to the proper name, as *buah* is to fruits. There is also the *malāti china* (nyctanthes multiflora); the elegant *buñga malāti sūsun* (nyctanthes acuminata); and the celebrated *buñga tonkīng* (pergularia odoratissima), whose fascinating sweets have been widely dispersed in England by the successful culture and liberal participation of Sir Joseph Banks. At Madras it obtained the appellation of West-coast, *i.e.* Sumatran creeper, which marks the quarter from whence it was obtained. At Bencoolen, the same appellation is familiarly applied to the *buñga tali-tali* (ipomœa quamoclit), a beautiful, little, monopetalous flower, divided into five angular segments, and closing at sunset. From its bright crimson colour, it received from Rumphius the name of flos cardinalis. The plant is a luxuriant creeper, with a hair-like leaf.

Nyctanthes.

Pergularia.

The *añgsūka*, or *buñga jarum-jarum* (pavetta indica), obtained from Rumphius, on account of the glowing red colour of its long calices, the name of flamma sylvarum peregrina. The *buñga marak* (poinciana pulcherrima) is a most splendid flower, the colours being a mixture of yellow and scarlet, and its form being supposed to resemble the crest of the peacock, from whence its Malayan name, which Rumphius translated.

Pavetta indica, &c.

The *nāgasāri* (calophyllum nagassari) bears a much admired blossom, well known in Bengal; but in the upper parts of India, called *nagakeh-sir*, and in the Batavian Trans. acacia aurea. The *bakong*, or *salandap* (crinum Asiaticum), is a plant of the lily kind, with six large, white, turbinated petals of an agreeable scent. It grows wild, near the beach, amongst those plants which bind the loose sands. Another and beautiful species of the *bakong* has a deep shade of purple mixed with the white. The *kachubong* (datura metel) appears also to flourish mostly by the sea-side. It bears a white, infundibuliform flower, rather pentagonal than round, with a small hook at each angle. The leaves are dark green, pointed, broad and unequal at the bottom. The fruit is shaped like an apple, very prickly, and full of small seeds. *Sundal malam* or harlot of the night (polyanthes tuberosa), is so termed, from the circumstance of its diffusing its sweet odours at that season. It is the tuberose of our gardens, but growing with great vigour and luxuriance. The *buñga mawur* (rosa semperflorens, Curtis, No. 284), is small, and of a deep crimson colour. Its scent is delicate, and by no means so rich as that yielded by the roses of our climate. The amaranthus cristatus (celosia castrensis, L.) is probably a native, being found commonly in the interior of the *Batta* country, where strangers have rarely penetrated. The various species of this genus are called by the general name of *bayam*, of which some are edible, as before observed.

Pandan. Of the *pandan* (pandanus), a shrub with very long, prickly leaves, like those of the pine-apple or aloe, there are many varieties, of which some are highly fragrant, particularly the *pandan wañgi* (pandanus odoratissima, L.), which produces a brownish white spath or blossom, one or two feet in length. This the natives shred fine and wear about their persons. The *pandan pudak*, or *keura* of Thunberg, which is also fragrant, I have reason to believe the same as the *wañgi*. The common sort is employed for hedging, and called *caldera* by Europeans in many parts of India. In the Nicobar islands it is cultivated, and yields a fruit called the *melori*, which is one of the principle articles of food.

Epidendra. *Buñga añggrek* (epidendrum). The species or varieties of this remarkable tribe of parasitical plants are very numerous, and may be said

said to exhibit a variety of loveliness. Kæmpfer describes two kinds by the names of *angurek warna* and *katong'ging*; the first of which I apprehend to be the *añggrek buñga putri* (angræcum scriptum, R.) and the other the *añggrek kasturi* (angræcum moschatum, R.) or scorpion flower, from its resembling that insect; as the former does the butter-fly. The musky scent resides at the extremity of the tail.[a]

The *buñga tarati* or *seruja* (nymphæa nelumbo) as well as several other beautiful kinds of aquatic plants, are found upon the inland waters of this country. *Daun gundi* or *tabung bru* (nepenthes destillatoria) can scarcely be termed a flower, but is a very extraordinary climbing plant. From the extremity of the leaf a prolongation of the mid-rib, resembling the tendril of a vine, terminates in a membrane formed like a tankard with the lid or valve half opened; and growing always nearly erect, it is commonly half full of pure water from the rain or dews. This monkey-cup (as the Malayan name implies) is about four or five inches long and an inch in diameter. *Giring landak* (crotalaria retusa) is a papilionaceous flower, resembling the lupin, yellow, and tinged at the extremities with red. From the rattling of its seed in the pod it obtains its name, which signifies porcupine-bells, alluding to the small bells worn about the ancles of children. The *daup* (bauhinia) is a small, white, semiflosculous flower, with a faint smell. The leaves alone attract notice, being double, as if united by a hinge, and this peculiarity suggested the Linnæan name, which was given in compliment to two brothers of the name of Bauhin, celebrated botanists, who always worked conjointly. Water lilies, &c.

To the foregoing list, in every respect imperfect, many interesting plants

[a] "Habetur hæc planta apud Javanos in deliciis et magno studio colitur; tum ob floris eximium odorem, quem spirat, moschi, tum ob singularem elegantiam et figuram scorpionis, quam exhibet . . . . . spectaculo sanè jocundissimo, ut negem quicquam elegantius et admiratione dignius in regno vegetabili me vidisse . . . . . Odorem flos moschi exquisitissimum atque adeo copiosum spargit, ut unicus stylus floridus totum conclave impleat. Qui verò odor, quod maximè mireris, in extremâ parte petali caudam referentis, residet; quâ abcissâ, omnis cessat odoris expiratio." Amœn exoticæ, p. 868.

plants might be added by an attentive and qualified observer. The natives themselves have a degree of botanical knowledge that surprises Europeans. They are in general, and at a very early age, acquainted not only with the names, but the properties of every shrub and herb amongst that exuberant variety with which the island is clothed. They distinguish the sexes of many plants and trees, and divide several of the genera into as many species as our professors. Of the *paku* or fern I have had specimens brought to me of twelve sorts, which they told me were not the whole, and to each they gave a distinct name.

Medicinal herbs. Some of the shrubs and herbs employed medicinally are as follows. Scarcely any of them are cultivated, being culled from the woods or plains as they happen to be wanted.

Lagundi (vitex trifolia, L.). The botanic characters of this shrub are well known. The leaves, which are bitter and pungent rather than aromatic, are considered as a powerful antiseptic, and are employed in fevers in the place of Peruvian bark. They are also put into granaries, and among cargoes of rice to prevent the destruction of the grain by weevils.

Katupong resembles the nettle in growth; in fruit the blackberry. I have not been able to identify it. The leaf, being chewed, is used in dressing small fresh wounds. *Sīup*, a kind of wild fig, is applied to the scurf or leprosy of the Nias people, when not inveterate. *Sikadūduk* (melastoma) has the appearance of a wild rose. A decoction of its leaves is used for the cure of a disorder in the sole of the foot, called *mallus*, resembling the impetigo or ring-worm. *Ampadu-brūang* or bear's gall (brucea, foliis serratis) is the *lussa raja* of Rumphius, excessively bitter, and applied in infusion, for the relief of disorders in the bowels. *Kabu* (unknown). Of this the bark and root are used for curing the *kūdis* or itch, by rubbing it on the part affected. *Marampuyan* (a new genus). The young shoots of this, being supposed to have a refreshing and corroborating quality, are rubbed over the body and limbs after violent fatigue. *Mali-mali* (unknown). The leaf of this plant, which bears a white umbellated blossom, is applied to reduce swellings.

swellings. *Chapo* (conyza balsamifera) resembles the sage (salvia) in colour, smell, taste, and qualities, but grows to the height of six feet, has a long jagged leaf, and its blossom resembles that of groundsel. *Murribuñgan* (unknown). The leaves of this climber are broad, roundish, and smooth. The juice of its stalk is applied to heal excoriations of the tongue. *Ampi-ampi* (unknown). A climbing plant, with leaves resembling the box, and a small flosculous blossom. It is used as a medicine in fevers. *Kadu* (sp. of piper), with a leaf in shape and taste resembling the betel. It is burned to preserve children newly-born from the influence of evil spirits. *Gumbai* (unknown). A shrub with monopitalous, stillated, purple flowers, growing in tufts. The leaves are used in disorders of the bowels. *Tabulan bukan* (unknown). A shrub bearing a semiflosculous blossom, applied to the cure of sore eyes. *Kachang prang* (dolichos ensiformis). The pods of this are of a huge size, and the beans, of a fine crimson colour, are used in diseases of the pleura. *Sīpīt*, a species of fig, with a large oval leaf, rough to the touch, and rigid. An infusion of it is swallowed in iliac affections. *Daun se-diñgin* (cotyledon laciniata). This leaf, as the name denotes, is of a remarkably cold quality. It is applied to the forehead to cure the head-ach, and sometimes to the body in fevers. Long pepper (piper longum) is used medicinally. Turmeric, also, mixed with rice reduced to powder, and then formed into a paste, is much used outwardly, in cases of colds, and pains in the bones; and chunam or quick lime, is likewise commonly rubbed on parts of the body affected with pain. In the cure of the *kura* or boss (from the Portuguese word baço), which is an obstruction of the spleen, forming a hard lump in the upper part of the abdomen, a decoction of the following plants is externally applied: *sipīt tuñggul; madang tandok* (a new genus, highly aromatic); *ati ayer* (sp. of arum ?) *tapa besi; paku tiong* (a most beautiful fern, with leaves like a palm; genus not ascertained); *tapa badak* (a variety of callicarpa); *laban* (vitex altissima); *pisang ruko* (sp. of musa); and *paku lamiding* (sp. of polypodium ?); together with a juice extracted from the *akar malabatei* (unknown). In the cure of the *kurap*, tetter or ringworm, they apply the *daun galiñggan* (cassia quadri-alata) an herbaceous shrub, with large pinnated leaves and a yellow blossom. In the more inveterate cases, *barañgan* (coloured arsenic, or orpiment), a strong poison, is rubbed in.

in. The milky exsudation from the *sudu-sudu* (euphorbia nerii folia) is valued highly by the natives for medicinal purposes. Its leaves eaten by sheep or goats occasion present death.

Upas tree. On the subject of the *pūhn ūpas* or poison tree (arbor toxicaria, R.), of whose properties so extraordinary an account was published in the London Magazine for September, 1785, by Mr. N. P Foersch, a surgeon in the service of the Dutch East India Company, at that time in England, I shall quote the observations of the late ingenious Mr. Charles Campbell, of the medical establishment at Fort Marlborough. "On my travels in the country at the back of Bencoolen I found the *upas* tree, about which so many ridiculous tales have been told. Some seeds must by this time have arrived in London in a packet I forwarded to Mr. Aiton at Kew. The poison is certainly deleterious, but not in so terrific a degree as has been represented. Some of it in an inspissated state you will receive by an early opportunity. As to the tree itself, it does no manner of injury to those around it. I have sat under its shade, and seen birds alight upon its branches; and as to the story of grass not growing beneath it, every one who has been in a forest must know that grass is not found in such situations." For further particulars respecting this poison-tree, which has excited so much interest, the reader is referred to Sir George Staunton's Account of Lord Macartney's Embassy, Vol. I. p. 272.; to Pennant's Outlines of the Globe, Vol. IV. p. 42. where he will find a copy of Foersch's original narrative; and to a Dissertation by Professor C. P. Thunberg upon the Arbor toxicaria Macassariensis, in the Mem. of the Upsal Acad. for 1788. The information given by Rumphius upon the subject of the *Ipo* or *Upas*, in his Herb. Amboin. Vol. II. p. 263. will also be perused with satisfaction.* It is evident that some of the exaggerated stories related to him

* Since the above was written I have seen the "Dissertation sur les Effets d'un Poison de Java, appelé *Upas tieuté*, &c.; présentée à la Faculté de Médicine de Paris le 6 Juillet 1809, par M. Alire Raffeneau-Delile," in which he details a set of curious and interesting experiments on this very active poison, made with specimens brought from Java by M. Leschenault; and also a second dissertation, in manuscript, (presented to the Royal Society,) upon the effects of similar experiments made with what he terms the *upas antiar*. The former he states to be a decoction or extract from the bark of the roots of a climbing plant of

by the people of Celebes (the plant not being indigenous at Amboina) suggested to Mr. Foersch, the fables with which he amused the world.

of the genus strychnos, called *ticuté* by the natives of *Java;* and the latter to be a milky, bitter, and yellowish juice, running from an incision in the bark of a large tree (new genus) called *antiar;** the word *upas* meaning, as M. Leschenault understands, vegetable poison of any kind. A small branch of the *puhn upas,* with some of the poisonous gum, was brought to England in 1806, by Dr. Roxburg, who informed Mr. Lambert that a plant of it which he had procured from Sumatra was growing rapidly in the Company's Botanic Garden at Calcutta. A specimen of the gum, by the favour of the latter gentleman, is in my possession.

Beasts.—Reptiles.—Fish.—Birds.—Insects.

Beasts. THE animal kingdom claims attention, but the quadrupeds of the island being in general the same as are found elsewhere throughout the East, already well described, I shall do little more than furnish a list of those which have occurred to my notice; adding a few observations on such as may appear to require them.

Buffalo. The *karbau*, or buffalo, constituting a principal part of the food of the natives, and being the only animal employed in their domestic labours, it is proper that I should enter into some detail of its qualities and uses; although it may be found not to differ materially from the buffalo of Italy, and to be the same with that of Bengal. The individuals of the species, as is the case with other domesticated cattle, differ extremely from each other in their degree of perfection, and a judgment is not to be formed of the superior kinds, from such as are usually furnished as provision to the ships from Europe. They are distinguished into two sorts; the black and the white. Both are equally employed in work, but the latter is seldom killed for food, being considered much inferior in quality, and by many as unwholesome, occasioning the body to break out in blotches. If such be really the effect, it may be presumed that the light flesh-colour is itself the consequence of some original disorder, as in the case of those of the human species who are termed white negroes. The hair upon this sort is extremely thin, scarcely serving to cover the hide; nor have the black buffaloes a coat like the cattle of England. The legs are shorter than those of the ox, the hoofs larger, and the horns are quite peculiar, being rather square or flat than round, excepting near the extremities; and whether pointing backward, as in general, or forwards, as they often do, are always in the plane of the forehead, and not at an angle, as those of the cow-kind. They contain much solid substance, and are valuable in manufacture. The tail hangs down

down to the middle joint of the leg only, is small, and terminates in a bunch of hair. The neck is thick and muscular, nearly round, but somewhat flatted at top, and has little or no dewlap dependant from it. The organ of generation in the male has an appearance as if the extremity were cut off. It is not a salacious animal. The female goes nine months with calf, which it suckles during six, from four teats. When crossing a river it exhibits the singular sight of carrying its young one on its back. It has a weak cry, in a sharp tone, very unlike the lowing of oxen. The most part of the milk and butter required for the Europeans (the natives not using either) is supplied by the buffalo, and its milk is richer than that of the cow, but not yielded in equal quantity. What these latter produce is also very small compared with the dairies of Europe. At Batavia, likewise, we are told that their cows are small and lean, from the scantiness of good pasture, and do not give more than about an English quart of milk, sixteen of which are required to make a pound of butter.

The inland people, where the country is tolerably practicable, avail themselves of the strength of this animal to draw timber felled in the woods: the Malays and other people on the coast train them to the draft, and in many places to the plough. Though apparently of a dull, obstinate, capricious nature, they acquire from habit a surprising docility, and are taught to lift the shafts of the cart with their horns, and to place the yoke, which is a curved piece of wood attached to the shafts, across their necks; needing no further harness than a breast-band, and a string that is made to pass through the cartilage of the nostrils. They are also, for the service of Europeans, trained to carry burthens suspended from each side of a pack-saddle, in roads, or rather paths, where carriages cannot be employed. It is extremely slow, but steady in its work. The labour it performs, however, falls short of what might be expected from its size and apparent strength, any extraordinary fatigue, particularly during the heat of the day, being sufficient to put a period to its life, which is at all times precarious. The owners frequently experience the loss of large herds, in a short space of time, by an epidemic distemper, called *bandung* (obstruction), that seizes them suddenly, swells their bo-

dies, and occasions, as it is said, the serum of the blood to distil through the tubes of the hairs.

The luxury of the buffalo consists in rolling itself in a muddy pool, which it forms, in any spot, for its convenience, during the rainy season. This it enjoys in a high degree, dexterously throwing with its horn the water and slime, when not of a sufficient depth to cover it, over its back and sides. Their blood is perhaps of a hot temperature, which may render this indulgence, found to be quite necessary to their health, so desirable to their feelings; and the mud, at the same time, forming a crust upon their bodies, preserves them from the attack of insects, which otherwise prove very troublesome. Their owners light fires for them in the evening, in order that the smoke may have the same effect, and they have the instinctive sagacity to lay themselves down to leeward, that they may enjoy its full benefit.

Although common in every part of the country, they are not understood to exist in the proper wild or indigenous state, those found in the woods being termed *karbau jalang*, or stray buffaloes, and considered as the subject of property; or if originally wild, they may afterwards, from their use in labour and food, have been all catched and appropriated by degrees. They are gregarious, and usually found in large numbers together, but sometimes met with singly, when they are more dangerous to passengers. Like the turkey, and some other animals, they have an antipathy to a red colour, and are excited by it to mischief. When in a state of liberty they run with great swiftness, keeping pace with the speed of an ordinary horse. Upon an attack or alarm they fly to a short distance, and then suddenly face about and draw up in battle-array with surprising quickness and regularity; their horns being laid back, and their muzzles projecting. Upon the nearer approach of the danger that presses on them, they make a second flight, and a second time halt and form; and this excellent mode of retreat, which but few nations of the human race have attained to such a degree of discipline as to adopt, they continue till they gain the fastnesses of a neighbouring wood. Their principal foe, next to man, is the tiger; but only the weaker sort, and the females

females fall a certain prey to this ravager, as the sturdy male buffalo can support the first vigorous stroke from the tiger's paw, on which the fate of the battle usually turns.

The cow, called *sapi* (in another dialect *sampi*) and *jawi*, is obviously a stranger to the country, and does not appear to be yet naturalized. The bull is commonly of what is termed the Madagascar breed, with a large hump upon the shoulders, but from the general small size of the herds, I apprehend that it degenerates, from the want of good pasture, the spontaneous production of the soil being too rank. Cow.

The horse, *kuda:* the breed is small, well made, and hardy. The country people bring them down in numbers for sale in nearly a wild state; chiefly from the northward. In the *Batta* country they are eaten as food; which is a custom also amongst the people of Celebes. Horse.

Sheep, *bīrī-bīrī* and *domba:* small breed, introduced probably from Bengal. Goat, *kambing:* beside the domestic species, which is in general small and of a light brown colour, there is the *kambing utan*, or wild goat. One which I examined was three feet in height, and four in the length of the body. It had something of the gazelle in its appearance, and, with the exception of the horns, which were about six inches long and turned back with an arch, it did not much resemble the common goat. The hinder parts were shaped like those of a bear, the rump sloping round off from the back; the tail was very small, and ended in a point; the legs clumsy; the hair along the ridge of the back rising coarse and strong, almost like bristles; no beard; over the shoulder was a large spreading tuft of greyish hair; the rest of the hair black throughout; the scrotum globular. Its disposition seemed wild and fierce, and it is said by the natives to be remarkably swift. Hog, *babi:* that breed we call Chinese. The wild hog, *babi utan.* Dog, *anjing:* those brought from Europe lose in a few years their distinctive qualities, and degenerate at length into the cur with erect ears, *kuyu*, vulgarly called the pariah dog. An instance did not occur of any one going mad during the period of my residence. Many of them are affected with a kind of gonorrhœa. Otter, *anjing ayer* (mustela lutra). Cat, *kuching:* these in every respect Sheep, &c.

resemble our common domestic cat, excepting that the tails of all are more or less imperfect, with a knob or hardness at the end, as if they had been cut or twisted off. In some the tail is not more than a few inches in length, whilst in others it is so nearly perfect, that the defect can be ascertained only by the touch. Rat, *tikūs:* of the grey kind. Mouse, *tikūs kechil.*

Elephant. Elephant, *gajah:* these huge animals abound in the woods, and from their gregarious habits usually traversing the country in large troops together, prove highly destructive to the plantations of the inhabitants, obliterating the traces of cultivation by merely walking through the grounds; but they are also fond of the produce of their gardens, particularly of plantain trees and the sugar-cane, which they devour with eagerness. This indulgence of appetite often proves fatal to them, for the owners knowing their attachment to these vegetables, have a practice of poisoning some part of the plantation, by splitting the canes and putting yellow arsenic into the clefts; which the animal unwarily eats of, and dies. Not being by nature carnivorous, the elephants are not fierce, and seldom attack a man but when fired at or otherwise provoked. Excepting a few kept for state by the king of Achin, they are not tamed in any part of the island.

Rhinoceros. The rhinoceros, *badak,* both that with a single horn and the double horned species, are natives of these woods. The latter has been particularly described by the late ingenious Mr. John Bell (one of the pupils of Mr. John Hunter) in a paper printed in Vol. LXXXIII. of the Phil. Trans for 1793. The horn is esteemed an antidote against poison, and on that account formed into drinking cups. I do not know any thing to warrant the stories told of the mutual antipathy, and the desperate encounters of these two enormous beasts.

Hippopotamus. Hippopotamus, *kūda ayer:* the existence of this quadruped in the island of Sumatra having been questioned by M. Cuvier, and not having myself actually seen it, I think it necessary to state that the immediate authority upon which I included it in the list of animals found there, was a drawing made by Mr. Whalfeldt, an officer employed on a survey of

of the coast, who had met with it at the mouth of one of the southern rivers, and transmitted the sketch along with his report to the government, of which I was then secretary. Of its general resemblance to that well-known animal there could be no doubt. M. Cuvier suspects that I may have mistaken for it the animal called by naturalists the *dugong*, and vulgarly the sea-cow, which will be hereafter mentioned; and it would indeed be a grievous errour to mistake for a beast with four legs, a fish with two pectoral fins serving the purposes of feet; but, independently of the authority I have stated, the *kūda-ayer*, or river-horse, is familiarly known to the natives, as is also the *duyong* (from which Malayan word the *dugong* of naturalists has been corrupted); and I have only to add, that in a register given by the Philosophical Society of Batavia, in the first Vol. of their Transactions, for 1799, appears the article "*couda aijeer*, rivier paard, hippopotamus" amongst the animals of Java.

Bear, *brūang*: generally small and black: climbs the coconut trees in order to devour the tender part or cabbage. Of the deer kind there are several species: *rusa*, the stag, of which some are very large; *kijang*, the roe, with unbranched horns, the emblem of swiftness and wildness with the Malayan poets; *palandok*, *napu*, and *kanchil*, three varieties, of which the last is the smallest, of that most delicate animal, termed by Buffon the chevrotin, but which belong to the moschus. Of a *kanchil* measured at Batavia, the extreme length was sixteen inches, and the height ten behind, and eight at the shoulder. *Babi-rusa*, or hog-deer: an animal of the hog kind, with peculiar tusks resembling horns. Of this there is a representation in Valentyn, Vol. III. p. 268. fig. c. and also in the very early travels of Cosmas, published in Thevenot's Collect. Vol. I. p. 2. of the Greek Text. The varieties of the monkey tribe are innumerable: among them the best known are the *muniet*, *karra*, *bru*, *siāmang* (or simia gibbon of Buffon), and *lutong*. With respect to the appellation of *orang utan*, or wild man, it is by no means specific, but applied to any of these animals of a large size that occasionally walks erect, and bears the most resemblance to the human figure. Sloth, *ku-kang*, *ka-malas-an* (lemur tardigradus). Squirrel, *tupei*; usually small and dark-coloured. *Teleggo*, stinkard. Bear, &c.

Tiger,

Tiger. Tiger, *arīmau, machang:* this beast is here of a very large size, and proves a destructive foe to man as well as to most other animals. The heads being frequently brought in to receive the reward given by the East India Company for killing them, I had an opportunity of measuring one, which was eighteen inches across the forehead. Many circumstances respecting their ravages, and the modes of destroying them, will occur in the course of the work. Tiger-cat, *kuching-rimau* (said to feed on vegetables as well as flesh). Civet-cat, *tañggalong* (viverra civetta): the natives take the civet, as they require it for use, from a peculiar receptacle under the tail of the animal. It appears from the *Ayin Akbari* (Vol. I. p. 103.) that the civet used at *Dehli* was imported from *Achin*. Pole-cat, *musang* (viverra fossa, or a new species). Porcupine (hystrix longicauda) *landak*, and, for distinction, *babi landak*. Hedge-hog (erinaceus) *landak*. *Peñg-goling*, signifying the animal which rolls itself up; or pangolin of Buffon: this is distinguished into the *peñg-goling rambut*, or hairy sort (myrmophoga), and the *peñg-goling sisik*, or scaly sort, called more properly *tañggīling* (species of manis); the scales of this are esteemed by the natives for their medicinal properties. See Asiat. Researches, Vol. I. p. 376. and Vol. II. p. 353.

Peng-goling.

Bats. Of the bat kind there is an extraordinary variety: the *churi-churi* is the smallest species, called vulgarly *burong tikus*, or the mouse-bird; next to these is the *kalalawar;* then the *kalambit;* and the *kaluwang* (noctilio) is of considerable size; of these I have observed very large flights occasionally passing at a great height in the air, as if migrating from one country to another, and Captain Forrest notices their crossing the straits of Sunda from *Java* head to Mount *Pugong;* they are also seen hanging by hundreds upon trees. The flying foxes and flying squirrels (lemur volans), which by means of a membrane extending from what may be termed the fore-legs to those behind, are enabled to take short flights, are also not uncommon.

Aligators and other lizards. Aligators, *buāya*, (crocodilus biporcatus of Cuvier) abound in most of the rivers, grow to a large size, and do much mischief. The guana, or iguana, *biāwak* (lacerta iguana) is another animal of the lizard kind, about three or four feet in length, harmless, excepting to the poultry and

and young domestic cattle, and sometimes itself eaten as food. The *biñgkarong* is next in size, has hard, dark scales on the back, and is often found under heaps of decayed timber; its bite venomous. The *koké*, *goké*, or *toké*, as it is variously called, is a lizard, about ten or twelve inches long, frequenting old buildings, and making a very singular noise. Between this and the small house-lizard (*chichak*) are many gradations in size, chiefly of the grass-lizard kind, which is smooth and glossy. The former are in length from about four inches down to an inch or less, and are the largest reptiles that can walk in an inverted situation: one of these, of size sufficient to devour a cockroach, runs on the ceiling of a room, and in that situation seizes its prey with the utmost facility. This they seem to be enabled to do, from the rugose structure of their feet, with which they adhere strongly to the smoothest surface. Sometimes, however, on springing too eagerly at a fly, they lose their hold, and drop to the floor; on which occasions a circumstance occurs not undeserving of notice. The tail being frequently separated from the body by the shock (as it may be, at any of the vertebræ, by the slightest force, without loss of blood or evident pain to the animal, and sometimes, as it would seem, from the effect of fear alone) within a little time, like the mutilated claw of a lobster, begins to renew itself. They are produced from eggs about the size of the wren's, of which the female carries two at a time, one in the lower, and one in the upper part of the abdomen, on opposite sides; they are always cold to the touch, and yet the transparency of their bodies gives an opportunity of observing that their fluids have as brisk a circulation as those of warm blooded animals: in none have I seen the peristaltic motion so obvious as in these. It may not be useless to mention that these phænomena were best observed at night, when the lizard was on the outside of a pane of glass, with a candle on the inside. There is, I believe, no class of living creatures in which the gradations can be traced with such minuteness and regularity as in this; where, from the small animal just described, to the huge aligator or crocodile, a chain may be traced containing almost innumerable links, of which the remotest have a striking resemblance to each other, and seem, at first view, to differ only in bulk. The cameleon, *gruning*: these are about a foot and half long, including the tail; the colour, green with brown spots, as I had it preserved; when alive in the woods they are Cameleon.

are generally green, but not from the reflection of the leaves, as some have supposed. When first caught they usually turn brown, apparently the effect of fear or anger, as men become pale or red; but, if undisturbed, soon resume a deep green on the back, and a yellow green on the belly, the tail remaining brown. Along the spine, from the head to the middle of the back, little membranes stand up like the teeth of a saw. As others of the genus of lacerta they feed on flies and grasshoppers, which the large size of their mouths, and peculiar structure of their bony tongues, are well adapted for catching. The flying lizard, *kubin*, or *chachak terbang* (draco volans), is about eight inches in its extreme length, and the membranes which constitute the wings are about two or three inches in extent. These do not connect with the fore and hind legs, as in the bat tribe, but are supported by an elongation of the alternate ribs, as pointed out by my friend Mr. Everard Home. They have flapped ears, and a singular kind of pouch or alphorges, under the jaws. In other respects they much resemble the cameleon in appearance. They do not take distant flights, but merely from tree to tree, or from one bough to another. The natives take them by springes fastened to the stems.

Frogs. With animals of the frog kind (*kodok*) the swamps every where teem; and their noise upon the approach of rain is tremendous. They furnish

Snakes. prey to the snakes, which are found here of all sizes and in great variety of species; the larger proportion harmless, but of some, and those generally small and dark-coloured, the bite is mortal. If the cobra capelo, or hooded snake, be a native of the island, as some assert, it must be extremely rare. The largest of the boa kind (*ular sauh*) that I had an opportunity of observing, was no more than twelve feet long. This was killed in a hen-house, where it was devouring the poultry. It is very surprising, but not less true, that snakes will swallow animals of twice or three times their own apparent circumference; having in their jaws or throat a compressive force that gradually and by great efforts reduces the prey to a convenient dimension. I have seen a small snake (*ular sini*) with the hinder legs of a frog sticking out of its mouth, each of them nearly equal to the smaller parts of its own body, which in the thickest did not exceed a man's little finger. The stories told of their swallowing deer,

deer, and even buffaloes, in Ceylon and Java, almost choke belief, but I cannot take upon me to pronounce them false; for if a snake of three inches diameter can gorge a fowl of six, one of thirty feet in length, and proportionate bulk and strength, might well be supposed capable of swallowing a beast of the size of a goat; and I have respectable authority for the fact, that the fawn of a *kījang* or roe was cut out of the body of a very large snake killed at one of the southern settlements. The poisonous kinds are distinguished by the epithet of *ular bīsa*, among which is the *biludak* or viper. The *ular garang*, or sea-snake, is coated entirely with scales, both on the belly and tail, not differing from those on the back, which are small and hexagonal; the colour is grey, with here and there shades of brown. The head and about one-third of the body from thence is the smallest part, and it increases in bulk towards the tail, which resembles that of the eel. It has not any dog-fangs.

Tortoise

The tortoise, *kura-kura*, and turtle, *katong*, are both found in these seas; the former valuable for its scales, and the latter as food; the land-tortoise (testudo græca) is brought from the Sechelles Islands. There is also an extensive variety of shell-fish. The cray-fish, *udang laut* (cancer homarus of écrevisse de mer), is as large as the lobster, but wants its biting claws. The small fresh water cray-fish, the prawns and shrimps, (all named *udang*, with distinctive epithets), are in great perfection. The crab, *kapīting* and *katam* (cancer), is not equally fine, but exhibits many extraordinary varieties. The *kīma*, or gigantic cockle, (chama) has been already mentioned (p. 15). The oysters, *tiram*, are by no means so good as those of Europe. The smaller kind are generally found adhering to the roots of the mangrove, in the wash of the tide. The muscle, *kupang* (mytilus), *rimis* (donax), *kapāng* (teredo navalis), sea-egg, *bulu babi* (echinus), *bia papeda* (nautilus), *ruma gorita* (argonauta), *bia unam* (murex), *bia bālāng* (cuprea), and many others may be added to the list. The beauty of the madrepores and corallines, of which the finest specimens are found in the recesses of the Bay of *Tappanuli*, is not to be surpassed in any country. Of these a superb collection is in the possession of Mr. John Griffiths, who has given, in Vol. XCVI. of the Phil. Trans. the "Description of a rare species of Worm-Shells, discovered at an island lying off the NW. coast of Sumatra." In the same

volume is also a Paper by Mr. Everard Home, containing "Observations on the Shell of the Sea Worm found on the Coast of Sumatra, proving it to belong to a species of Teredo; with an Account of the Anatomy of the Teredo Navalis." The former he proposes to call the teredo gigantea. The sea-grass, or *ladang laut*, concerning which Sir James Lancaster tells some wonderful stories, partakes of the nature of a sea-worm and of a coralline; in its original state it is soft and shrinks into the sand from the touch; but when dry it is quite hard, straight, and brittle.

Fish. The *dūyōng* is a very large sea-animal or fish, of the order of mammalia, with two large pectoral fins serving the purposes of feet. By the early Dutch voyagers it was, without any obvious analogy, called the sea-cow; and from the circumstance of the head being covered with a kind of shaggy hair, and the mammæ of the female being placed immediately under the pectus, it has given rise to the stories of mermaids in the tropical seas. The tusks are applied to the same uses as ivory, especially for the handles of krises, and being whiter are more prized. It has much general resemblance to the manati or lamantin of the West Indies, and has been confounded with it; but the distinction between them has been ascertained by M. Cuvier, Annales du Mus. d' H. Nat. XXII. cahier, p. 308.[a]

Whale. The grampus whale (species of delphinus) is well known to the natives by the names of *pāwus* and *gajah mīna*; but I do not recollect to have heard any instance of their being thrown upon the coast. Of the Voilier. *ikan layer* (genus novum schombro affine) a grand specimen is preserved in the British Museum, where it was deposited by Sir Joseph Banks;[b] and a description of it by the late M. Brousonet, under the name of le Voilier, is published in the Mem. de l' Acad. de Scien. de Paris for 1786, p. 450,

[a] "Sometime ago (says Captain Forrest) a large fish, with valuable teeth, being cast ashore in the *Illano* districts, there arose a dispute who should have the teeth, but the *Magindanoers* carried it." Voyage to New Guinea, p. 272. See also Valentyn, Vol. III. p. 341.

[b] This fish was hooked by Mr. John Griffiths near the southern extremity of the west coast of Sumatra, and was given to Captain Cumming of the Britannia indiaman, by whom it was presented to Sir Joseph Banks.

p. 450, pl. x. It derives its appellation from the peculiarity of its dorsal fin, which rises so high as to suggest the idea of a sail; but it is most remarkable for what should rather be termed its snout than its horn, being an elongation of the frontal bone, and the prodigious force with which it occasionally strikes the bottoms of ships, mistaking them, as we may presume, for its enemy or prey. A large fragment of one of these bones, which had transfixed the plank of an East India ship, and penetrated about eighteen inches, is likewise preserved in the same national collection, together with the piece of plank, as it was cut out of the ship's bottom upon her being docked in England. Several accidents of a similar nature are known to have occurred. There is an excellent representation of this fish, under the name of *fetisso*, in Barbot's Description of the Coasts of Guinea, plate 18, which is copied in Astley's Collection of Voyages, Vol. II. plate 73.

To attempt an enumeration of the species of fish with which these seas abound, would exceed my power, and I shall only mention briefly some of the most obvious; as the shark, *hiyu* (squalus); skate, *ikan pari*, (raya); *ikan mūa* (muræna); *ikan chanak* (gymnotus); *ikan gajah* (cepole); *ikan karang* or *bonna* (chætodon), described by Mr. John Bell, in Vol. LXXXII. of the Phil. Trans. It is remarkable for certain tumours filled with oil, attached to its bones. There are also the *ikan krapo*, a kind of rock-cod or sea-perch; *ikan marrang* or *kitang* (teuthis), commonly named the leather fish, and among the best brought to table; *jinnihin*, a rock-fish shaped like a carp; *bawal* or pomfret (species of chætodon); *balānak*, *jumpul*, and *marra*, three fish of the mullet kind (mugil); *kuru* (polynemus); *ikan lidah*, a kind of sole; *tiñgēri*, resembles the mackerel; *gagu*, cat-fish; *summa*, a river fish, resembling the salmon; *riñgkis*, resembles the trout, and is noted for the size of its roe; *ikan tambarah*, I believe the shad of Siak River; *ikan gadis*, good river fish, about the size of a carp; *ikan bada*, small, like white bait; *ikan gorita*, sepia; *ikan terbang*, flying-fish (exocœtus). The little sea-horse (syngnathus hippocampus) is commonly found here. Various fish.

Of birds the variety is considerable, and the following list contains but a small portion of those that might be discovered in the island by a qualified Birds.

lified person, who should confine his researches to that branch of natural history.

Kuwau. The *kuwau*, or Sumatran pheasant (phasianus argus), is a bird of uncommon magnificence and beauty; the plumage being perhaps the most rich, without any mixture of gaudiness, of all the feathered race. It is found extremely difficult to keep it alive for any considerable time after catching it in the woods, yet it has in one instance been brought to England; but having lost its fine feathers by the voyage, it did not excite curiosity, and died unnoticed. There is now a good specimen in the Liverpool Museum. It has, in its natural state, an antipathy to the light, and in the open day is quite moped and inanimate. When kept in a darkened place it seems at its ease, and sometimes makes use of the note or call from which it takes its name, and which is rather plaintive than harsh. The flesh, of which I have eaten, perfectly resembles that of the common pheasant (*tugang*), also found in the woods, but the body is of much larger size. I have reason to believe that it is not, as supposed, a native of the North or any part of China. From the Malayan Islands, of which it is the boast, it must be frequently carried thither. The peacock, *burong marak* (pavo), appears to be well known
Peacock, &c. to the natives, though, I believe, not common. I should say the same of the eagle and the vulture (coracias), to the one or the other of which the name of *raja wali* is familiarly applied. The kite, *alang* (falco), is very common, as is the crow, *gadak* (corvus), and jack-daw, *pong* (gracula), with several species of the wood-pecker. The king-fisher (alcedo) is named *burong buāya*, or the aligator bird. The bird of paradise, *burong supan*, or elegant bird, is known here only in the dried state, as brought from the Moluccas and coast of New Guinea (*tanah papuah*).

The rhinoceros bird, horn-bill, or calao (buceros), called by the natives *anggang* and *burong tāun*, is chiefly remarkable for what is termed the horn, which in the most common species extends half way down the upper mandible of its large beak, and then turns up; but the varieties of shape are numerous. The length of one I measured whilst alive was ten inches and an half; the breadth, including the horn, six and an half;

length

length from beak to tail four feet; wings four feet six inches; height one foot; length of neck one foot; the beak whitish; the horn yellow and red, the body black; the tail white ringed with black; rump, and feathers on the legs down to the heel, white; claws three before and one behind; the iris red. In a hen chick there was no appearance of a horn, and the iris was whitish. They eat either boiled rice or tender fresh meat. Of the use of such a singular cavity I could not learn any plausible conjecture. As a receptacle for water, it must be quite unnecessary in the country of which it is a native.

Of the stork kind there are several species, some of great height and otherwise curious, as the *burong kambing* and *burong ular*, which frequent the rice plantations in wet ground. We find also the heron, *burong kuntul* (ardea); the snipe, *kandidi* (scolopax); the coot, or water hen, *ayam ayer* (fulica); and the plover, *cheruling* (charadrius). The cassawary, *burong rusa*, is brought from the island of Java. Stork, &c.

The domestic hen is as common as in most other countries. In some the bones (or the periostea) are black, and these are at least equally good as food. The hen of the woods, *ayam barugo*, or *ayam utan*, (which latter name is in some places applied to the pheasant) differs little from the common sort, excepting in the uniformity of its brown colour. In the *Lampong* country, of Sumatra, and western part of Java lying opposite to it, there is a very large breed of fowls, called *ayam jago*; of these I have seen a cock peck from off of a common dining table; when inclined to rest, they sit on the first joint of the leg, and are then taller than the ordinary fowls. It is singular, if the same country produces likewise the diminutive breed that goes by the name of *Bantam*. A species of partridge is called *ayam gunong*, or mountain hen.

Beside the pigeon, *merapeti* and *burong darah* (columba), and two common species of doves, the one of a light brown or dove-colour, called *ballum*, and the other green, called *punei*, there are of the latter some most exquisite varieties: the *punei jambu* is smaller than the usual size of doves; the back, wings, and tail, are green; the breast and crop are white, but the front of the latter has a slight shade of pink; the fore- Doves.

part

part of the head is of a deep pink, resembling the blossom of the *jambu* fruit, from whence its name; the white of the breast is continued in a narrow streak, having the green on one side and the pink on the other, half round the eye, which is large, full, and yellow; of which colour is also the beak. It will live upon boiled rice and padi; but its favourite food, when wild, is the berry of the *rumpunnei* (ardisia coriacea), perhaps from this circumstance so called. The *selaya*, or *punei andu*, another variety, has the body and wings of deep crimson, with the head, and extremity of its long indented tail, white; the legs red. It lives on the worms generated in the decayed part of old trees, and is about the size of a blackbird. Of the same size is the *burong sawei*, a bird of a bluish black colour, with a dove-tail, from which extend two very long feathers, terminating circularly. It seems to be what is called the widow bird, and is formidable to the kite. The *burong pīpit* resembles the sparrow in its appearance, habits, numbers, and the destruction it causes to the grain. The quail, *puyuh* (coturnix); but whether a native or a bird of passage, I cannot determine. The starling (sturnus), of which I know not the Malayan name. The swallow, *layang-layang* (hirundo), one species of which, called *layang būhi*, from its being supposed to collect the *froth* of the sea, is that which constructs the edible nests. The *murei*, or dial-bird, resembling a small magpie, has a pretty but short note. There is not any bird in the country that can be said to sing. The *tiyong*, or mino, a black bird with yellow gills, has the faculty of imitating human speech in greater perfection than any other of the feathered tribe. There is also a yellow species, but not loquacious. Of the parrot kind the variety is not so great as might be expected, and consists chiefly of those denominated paroquets. The beautiful *luri*, though not uncommon, is brought from the eastward. The *kakatūa* is an inhabitant chiefly of the southern extremity of the island.

The Indian goose, *angsa* and *gangsa* (anser); the duck, *bebek* and *itik* (anas); and the teal, *belībi*, are common.

Insects. With insects the island may truly be said to swarm; and I doubt whether there is any part of the world where greater variety is to be found. Of these I shall only attempt to enumerate a few: the *kunang*, or fire-fly,

fly, larger than the common fly, (which it resembles), with the phosphoric matter in the abdomen, regularly and quickly intermitting its light, as if by respiration; by holding one of them in my hand I could see to read at night; *lipas*, the cockroach (blatta); *chiñgkarek*, the cricket (gryllus); *lebah*, *taun*, the bee (apis), whose honey is gathered in the woods; *kumbang*, a species of apis, that bores its nest in timber, and thence acquires the name of the carpenter; *sumut*, the ant (formica), the multitudes of which overrun the country, and its varieties are not less extraordinary than its numbers. The following distinctions are the most obvious: the *krañgga*, or great red ant, about three-fourths of an inch long, bites severely, and usually leaves its head, as a bee its sting, in the wound; it is found mostly on trees and bushes, and forms its nest by fastening together, with a glutinous matter, a collection of the leaves of a branch, as they grow; the common red ant; the minute red ant; the large black ant, not equal in size to the *krañgga*, but with a head of disproportioned bulk; the common black ant; and the minute black ant: they also differ from each other in a circumstance which I believe has not been attended to; and that is the sensation with which they affect the taste when put into the mouth, as frequently happens unintentionally: some are hot and acrid, some bitter, and some sour. Perhaps this will be attributed to the different kinds of food they have accidentally devoured; but I never found one which tasted sweet, though I have caught them in the fact of robbing a sugar or honey-pot. Each species of ant is a declared enemy of the other, and never suffers a divided empire. Where one party effects a settlement, the other is expelled; and in general they are powerful in proportion to their bulk, with the exception of the white ant, *sumut putih* (termes), which is beaten from the field by others of inferior size; and for this reason it is a common expedient to strew sugar on the floor of a warehouse, in order to allure the formicæ to the spot, who do not fail to combat and overcome the ravaging, but unwarlike termites. Of this insect and its destructive qualities I had intended to give some description, but the subject is so elaborately treated (though with some degree of fancy) by Mr. Smeathman in Vol. LXXI. of the Phil. Trans. for 1781, who had an opportunity of observing them in Africa, that I omit it as superfluous. Of the wasp kind there are several curious varieties. One of them may be observed building its nest

of

of moistened clay against a wall, and inclosing in each of its numerous compartments a living spider; thus revenging upon this blood-thirsty race the injuries sustained by harmless flies, and providently securing for its own young a stock of food. *Lalat*, the common fly (musca); *lalat kuda* (tabanus); *lalat karbau* (œstrus); *niamok*, *agas*, the gnat or mosquito (culex), producing a degree of annoyance equal to the sum of all the other physical plagues of a hot climate, but even to these I found that habit rendered me almost indifferent; *kala-jingking*, the scorpion (scorpio), the sting of which is highly inflammatory and painful, but not dangerous; *sipāsan*, centipede (scholopendra), not so venomous as the preceding; *alipan* (jules); *alintah*, water-leech (hirudo); *achih*, small land-leech, dropping from the leaves of trees whilst moist with dew, and troublesome to travellers in passing through the woods. To this list I shall only add the *suāla*, tripan, or sea-slug (holothurion), which, being collected from the rocks and dried in the sun, is exported to China, where it is an article of food.

Vegetable productions of the island considered as articles of commerce. Pepper.—Cultivation of Pepper.—Camphor.—Benzoin.—Cassia, &c.

OF those productions of Sumatra, which are regarded as articles of commerce, the most important and most abundant is pepper. This is the object of the East India Company's trade thither, and this alone it keeps in its own hands; its servants, and merchants under its protection, being free to deal in every other commodity. Pepper.

Many of the princes or chiefs in different parts of the island having invited the English to form settlements in their respective districts, factories were accordingly established, and a permanency and regularity thereby given to the trade, which was very uncertain whilst it depended upon the success of occasional voyages to the coast; disappointments ensuing not only from failure of adequate quantities of pepper to furnish cargoes when required, but also from the caprices and chicanery of the chiefs with whom the disposal of it lay, the motives of whose conduct could not be understood by those who were unacquainted with the language and manners of the people. These inconveniencies were obviated when the agents of the Company were enabled, by their residence on the spot, to obtain an influence in the country, to inspect the state of the plantations, secure the collection of the produce, and make an estimate of the tonnage necessary for its conveyance to Europe. Establishment of the trade.

In order to bind the chiefs to the observance of their original promises and professions, and to establish a plausible and legal claim, in opposition to the attempts of rival European powers to interfere in the trade of the same country, written contracts, attended with much form and solemnity, were entered into with the former; by which they engaged to oblige all their dependants to cultivate pepper, and to secure to us the exclusive purchase of it; in return for which they were to be protected

from their enemies, supported in the rights of sovereignty, and to be paid a certain allowance or custom, on the produce of their respective territories.

Price. The price for many years paid to the cultivators for their produce, was ten Spanish dollars or fifty shillings per *bahar* of five hundred weight or five hundred and sixty pounds. About the year 1780, with a view to their encouragement and the increase of investment, as it is termed, the sum was augmented to fifteen dollars. To this cost is to be added the custom above-mentioned, varying in different districts according to specific agreements, but amounting in general to one dollar and an half, or two dollars on each *bahar*, which is distributed amongst the chiefs at an annual entertainment; and presents are made at the same time to planters who have distinguished themselves by their industry. This low price, at which the natives submit to cultivate the plantations, affording to each man an income of not more than from eight to twelve dollars yearly, and the undisturbed monopoly we have so long possessed of the trade, from near *Indrapura* northward to Flat Point southward, are doubtless in a principal degree to be attributed to the peculiar manner in which this part of the island is shut up, by the surfs which prevail along the south-west coast, from communication with strangers, whose competition would naturally produce the effect of enhancing the price of the commodity. The general want of anchorage too, for so many leagues to the northward of the Straits of Sunda, has in all ages deterred the Chinese and other eastern merchants from attempting to establish an intercourse, that must be attended with imminent risk to unskilful navigators; indeed, I understand it to be a tradition among the natives who border on the sea-coast, that it is not many hundred years since these parts began to be inhabited, and they speak of their descent as derived from the more inland country. Thus it appears that those natural obstructions, which we are used to lament as the greatest detriment to our trade, are in fact advantages to which it in a great measure owes its existence. In the northern countries of the island, where the people are numerous and their ports good, they are found to be more independent also, and refuse to cultivate plantations upon any other terms than those on which they can deal with private traders.

In

In the cultivation of pepper (piper nigrum, L.)* the first circumstance that claims attention, and on which the success materially depends, is the choice of a proper site for the plantation. A preference is usually given to level ground lying along the banks of rivers or rivulets, provided they are not so low as to be inundated, both on account of the vegetable mould commonly found there, and the convenience of water-carriage for the produce. Declivities, unless very gentle, are to be avoided, because the soil loosened by culture, is liable in such situations to be washed away by heavy rains. When these plains, however, are naked, or covered with long grass only, they will not be found to answer without the assistance of the plough and of manure; their fertility being exhausted by exposure to the sun. How far the returns in general might be increased by the introduction of these improvements in agriculture I cannot take upon me to determine; but I fear, that from the natural indolence of the natives, and their want of zeal in the business of pepper-planting, occasioned by the smallness of the advantage it yields to them, they will never be prevailed upon to take more pains than they now do. The planters, therefore, depending more upon the natural qualities of the soil than on any advantage it might receive from their cultivation, find none to suit their purpose better than those spots which, having been covered with old woods and long fertilized by decaying foliage and trunks, have recently been cleared for *ladangs* or *padi* fields, in the manner already described; where it was also observed, that being allured by the certainty of abundant produce from a virgin soil, and having land for the most part at will, they renew their toil annually, and desert the ground so laboriously prepared, after occupying it for one, or at the furthest for two, seasons. Such are the most usual situations chosen for the pepper plantations (*kabūn*) or gardens, as they are termed; but, independently of the culture of rice, land is very frequently cleared for the pepper in the first instance, by felling and burning the trees. Cultivation of pepper.

The ground is then marked out in form of a regular square or oblong, with Formation of the garden.

* See Remarks on the Species of Pepper (and on its Cultivation) at Prince of Wales Island, by Dr. William Hunter, in the Asiat. Res. Vol. IX. p. 383.

with intersections throughout, at the distance of six feet, (being equal to five cubits of the measure of the country) the intended interval between the plants, of which there are commonly either one thousand or five hundred in each garden; the former number being required from those who are heads of families (their wives and children assisting them in their work), and the latter from single men. * Industrious or opulent persons sometimes have gardens of two or three thousand vines. A border twelve feet in width, within which limit no tree is suffered to grow, surrounds each garden, and it is commonly separated from others by a row of shrubs or irregular hedge. Where the nature of the country admits of it, the whole or greater part of the gardens of a *dusun* or village lie adjacent to each other, both for the convenience of mutual assistance in labour, and mutual protection from wild beasts; single gardens being often abandoned from apprehension of their ravages, and where the owner has been killed in such a situation, none will venture to replace him.

Vegetating props.

After lining out the ground, and marking the intersections by slight stakes, the next business is to plant the trees that are to become props to the pepper, as the Romans planted elms, and the modern Italians more commonly plant poplars and mulberries, for their grape-vines. These are cuttings of the *chiñgkariang* (erythrina corallodendron), usually called chinkareens, put into the ground about a span deep, sufficiently early to allow time for a shoot to be strong enough to support the young pepper-plant when it comes to twine about it. The cuttings are commonly two feet in length, but sometimes a preference is given to the length of six feet, and the vine is then planted as soon as the chinkareen has taken root: but the principal objections to this method are, that in such state they are very liable to fail and require renewal, to the prejudice of the garden; and that their shoots are not so vigorous as those of the short cuttings, frequently growing crooked, or in a lateral instead of a perpendicular direction. The circumstances which render the chinkareen particularly proper for this use, are its readiness and quickness of growth, even after the cuttings have been kept some time in bundles,* if

* It is a common and useful practice to place these bundles of cuttings in water about two inches deep, and afterwards to reject such of them as in that state do not shew signs of vegetation.

if put into the ground with the first rains; and the little thorns with which it is armed enabling the vine to take a firmer hold. They are distinguished into two sorts, the white and red, not from the colour of the flowers (as might be supposed) for both are red, but from the tender shoots of the one being whitish, and of the other being of a reddish hue. The bark of the former is of a pale ash colour, of the latter brown; the former is sweet, and the food of elephants, for which reason it is not much used in parts frequented by those animals; the latter is bitter and unpalatable to them; but they are not deterred by the short prickles which are common to the branches of both sorts.

Trial has frequently been made of other trees, and particularly of the *bañgkudu* or *mañgkudu* (morinda citrifolia), but none have been found to answer so well for these vegetating props. It has been doubted, indeed, whether the growth and produce of the pepper-vine are not considerably injured by the chinkareen, which may rob it of its proper nourishment by exhausting the earth; and on this principle, in other of the eastern islands, (Borneo, for instance) the vine is supported by poles, in the manner of hops in England. Yet it is by no means clear to me, that the Sumatran method is so disadvantageous in the comparison as it may seem; for, as the pepper-plant lasts many years, whilst the poles, exposed to sun and rain, and loaded with a heavy weight, cannot be supposed to continue sound above two seasons, there must be a frequent renewal, which, notwithstanding the utmost care, must lacerate and often destroy the vines. It is probable also that the shelter from the violence of the sun's rays afforded by the branches of the vegetating prop, and which, during the dry monsoon, is of the utmost consequence, may counterbalance the injury occasioned by their roots; not to insist on the opinion of a celebrated writer, that trees, acting as siphons, derive from the air and transmit to the earth as much of the principle of vegetation, as is expended in their nourishment.

When the most promising shoot of the chinkareen reserved for rearing has attained the height of twelve to fifteeen feet (which latter it is not to exceed), or in the second year of its growth, it must be headed or topped;

ped; and the branches that then extend themselves laterally, from the upper part only, so long as their shade is required, are afterwards lopped annually at the commencement of the rainy season (about November), leaving little more than the stem; from whence they again shoot out to afford their protection during the dry weather. By this operation also the damage to the plant that would ensue from the droppings of rain from the leaves, is avoided.

Description of the pepper vine.

The pepper-vine is, in its own climate, a hardy plant, growing readily from cuttings or layers, rising in several knotted stems, twining round any neighbouring support, and adhering to it by fibres that shoot from every joint at intervals of six to ten inches, and from which it probably derives a share of its nourishment. If suffered to run along the ground, these fibres would become roots; but in this case (like the ivy) it would never exhibit any appearance of fructification, the prop being necessary for encouraging it to throw out its bearing shoots. It climbs to the height of twenty or twenty-five feet, but thrives best when restrained to twelve or fifteen, as in the former case the lower part of the vine bears neither leaves nor fruit, whilst in the latter it produces both from within a foot of the ground. The stalk soon becomes ligneous, and in time acquires considerable thickness. The leaves are of a deep green and glossy surface, heart-shaped, pointed, not pungent to the taste, and have but little smell. The branches are short and brittle, not projecting above two feet from the stem, and separating readily at the joints. The blossom is small and white; the fruit round, green when young and full-grown, and turning to a bright red when ripe and in perfection. It grows abundantly from all the branches, in long, small clusters of twenty to fifty grains, somewhat resembling bunches of currants, but with this difference, that every grain adheres to the common stalk, which occasions the cluster of pepper to be more compact, and it is also less pliant.

Modes of propagating it.

The usual mode of propagating the pepper is by cuttings, a foot or two in length, of the horizontal shoots that run along the ground from the foot of the old vines (called *lado sūlūr*), and one or two of these are planted

ed within a few inches of the young chinkareen, at the same time with it, if of the long kind, or six months after, if of the short kind, as before described. Some, indeed, prefer an interval of twelve months; as in good soil the luxuriancy of the vine will often overpower and bear down the prop, if it has not first acquired competent strength. In such soil the vine rises two or three feet in the course of the first year, and four or five more in the second, by which time, or between the second and third year of its growth, it begins to shew its blossom (*be-gagang*), if in fact it can be called such, being nothing more than the germ of the future bunch of fruit, of a light straw colour, darkening to green as the fruit forms. These germs or blossoms are liable to fall untimely (*gugur*) in very dry weather, or to be shaken off in high winds (although from this accident the gardens are in general well sheltered by the surrounding woods), when, after the fairest promise, the crop fails. In the rainy weather that succeeds the first appearance of the fruit, the whole vine is loosened from the chinkareen, and turned down again into the earth, a hole being dug to receive it, in which it is laid circularly or coiled, leaving only the extremity above ground, at the foot of the chinkareen, which it now reascends with redoubled vigour, attaining in the following season the height of eight or ten feet, and bearing a full crop of fruit. There is said to be a great nicety in hitting the exact time proper for this operation of turning down; for if it be done too soon, the vines have been known not to bear till the third year, like fresh plants; and on the other hand, the produce is ultimately retarded, when they omit to turn them down until after the first fruit has been gathered; to which, avarice of present, at the expense of future advantage, sometimes inclines the owners. It is not very material how many stems the vine may have in its first growth, but now one only, if strong, or two at the most, should be suffered to rise and cling to the prop: more would be superfluous and only weaken the whole. The supernumerary shoots, however, are usefully employed, being either conducted through narrow trenches to adjacent chinkareens, whose vines have failed, or taken off at the root and transplanted to others more distant, where, coiled round and buried as the former, they rise with the same vigour, and the garden is completed of uniform growth, although many of its original vines have not succeeded.

Turning down the vines.

ceeded. With these off-sets or layers (called *añggor* and *tettas*) new gardens may be at once formed; the necessary chinkareens being previously planted, and of sufficient growth to receive them.

This practice of turning down the vines, which appears singular, but certainly contributes to the duration as well as strength of the plants, may yet amount to nothing more than a substitute for transplantation. Our people observing that vegetables often fail to thrive when permitted to grow up in the same beds where they were first set or sown, find it advantageous to remove them, at a certain period of their growth, to fresh situations. The Sumatrans observing the same failure, have had recourse to an expedient nearly similar in its principle, but effected in a different and perhaps more judicious mode.

In order to lighten the labour of the cultivator, who has also the indispensable task of raising grain for himself and his family, it is a common practice, and not attended with any detriment to the gardens, to sow *padi* in the ground in which the chinkareens have been planted, and when this has become about six inches high, to plant the cuttings of the vines, suffering the shoots to creep along the ground until the crop has been taken off; when they are trained to the chinkareens; the shade of the corn being thought favourable to the young plants.

Progress of bearing.

The vines, as has been observed, generally begin to bear in the course of the third year from the time of planting, but the produce is retarded for one or two seasons by the process just described; after which it increases annually for three years, when the garden (about the seventh or eighth year) is esteemed in its prime, or at its utmost produce; which state it maintains, according to the quality of the soil, from one to four years, when it gradually declines, for about the same period, until it is no longer worth the labour of keeping it in order. From some, in good ground, fruit has been gathered at the age of twenty years; but such instances are uncommon. On the first appearance of decline it should be renewed, as it is termed; but, to speak more properly, another garden should be planted to succeed it, which will begin to bear before the old one ceases.

The

The vine having acquired its full growth, and being limited by the height of the chinkareen, sometimes grows bushy and overhangs at top, which, being prejudicial to the lower parts, must be corrected by pruning or thinning the top branches, and this is done commonly by hand, as they break readily at every joint. Suckers too, or superfluous side-shoots (*charang*), which spring luxuriantly, are to be plucked away. The ground of the garden must be kept perfectly clear of weeds, shrubs, and whatever might injure or tend to choke the plants. During the hot months of June, July, and August, the finer kinds of grass may be permitted to cover the ground, as it contributes to mitigate the effects of the sun's power, and preserves for a longer time the dews, which at that season fall copiously; but the rank species, called *lalang*, being particularly difficult to eradicate, should not be suffered to fix itself, if it can be avoided. As the vines increase in size and strength less attention to the ground is required, and especially as their shade tends to check the growth of weeds. In lopping the branches of the chinkareens preparatory to the rains, some dexterity is required that they may fall clear of the vine, and the business is performed with a sharp *prang* or bill that generally separates at one stroke the light, pithy substance of the bough. For this purpose, as well as that of gathering the fruit, light, triangular ladders made of bamboo are employed. As soon as any of the berries or corns redden, the bunch is reckoned fit for gathering, the remainder being then generally full-grown, although green; nor would it answer to wait for the whole to change colour, as the most mature would drop off. It is collected in small baskets slung over the shoulder, and with the assistance of the women and children conveyed to a smooth, level spot of clean, hard ground, near the garden or the village, where it is spread, sometimes upon mats, to dry in the sun; but exposed at the same time to the vicissitudes of the weather, which are not much regarded, nor thought to injure it. In this situation it becomes black and shrivelled, as we see it in Europe, and as it dries is hand-rubbed occasionally to separate the grains from the stalk. It is then winnowed in large, round, shallow sieves, called *nyiru*, and put in large vessels made of bark (*kulitkayu*) under their houses, until the whole of the crop is gathered, or a sufficient quantity for carrying (usually by water) to the European factory or *gadong*, at the mouth of the river. That which has been gathered

Mode of pruning.

Time of gathering.

Mode of drying and cleansing.

thered at the properest stage of maturity will shrivel the least; but, if plucked too soon, it will in a short time, by removal from place to place, become mere dust. Of this defect trial may be made by the hand; but as light pepper may have been mixed with the sound, it becomes necessary that the whole should be garbled at the scale by machines constructed for the purpose. Pepper that has fallen to the ground overripe, and been gathered from thence, will be known by being stripped of its outer coat, and in that state is an inferior kind of white pepper.

White pepper. This was for centuries supposed in Europe to be the produce of a different plant, and to possess qualities superior to those of the common black pepper; and accordingly it sold at a considerably higher price. But it has lost in some measure that advantage since it has been known that the secret depended merely upon the art of blanching the grains of the other sort, by depriving it of the exterior pellicle. For this purpose the ripest red grains are picked out and put in baskets to steep, either in running water (which is preferred), in pits dug for the occasion, near the banks of rivers, or in stagnant pools. Sometimes it is only buried in the ground. In any of these situations it swells, and, in the course of a week or ten days, bursts its tegument, from which it is afterwards carefully separated by drying in the sun, rubbing between the hands, and winnowing. It has been much disputed, and is still undetermined, to which sort the preference ought to be given. The white pepper has this obvious recommendation, that it can be made of no other than the best and soundest grains, taken at their most perfect stage of maturity: but, on the other hand, it is argued, that by being suffered to remain the necessary time in water, its strength must be considerably diminished; and that the outer husk, which is lost by the process, has a peculiar flavour distinct from that of the heart, and though not so pungent, more aromatic. For the white pepper the planter receives the fourth part of a dollar, or fifteen-pence, per bamboo or gallon measure, equal to about six pounds weight. At the sales in England the prices are at this time in the proportion of seventeen to ten or eleven, and the quantity imported has for some years been inconsiderable.

Appearance of the gardens. The gardens being planted in even rows, running parallel, and at

at right angles with each other, their symmetrical appearance is very beautiful, and rendered more striking by the contrast they exhibit to the wild scenes of nature which surround them. In highly cultivated countries, such as England, where landed property is all lined out, and bounded and intersected with walls and hedges, we endeavour to give our gardens and pleasure grounds the charm of variety and novelty, by imitating the wildness of nature, in studied irregularities. Winding walks, hanging woods, craggy rocks, falls of water, are all looked upon as improvements; and the stately avenues, the canals, and rectangular lawns of our ancestors, which afforded the beauty of contrast, in ruder times, are now exploded. This difference of taste is not merely the effect of caprice, nor entirely of refinement, but results from the change of circumstances. A man who should attempt to exhibit in Sumatra, the modern, or irregular style of laying out grounds, would attract but little attention, as the unimproved scenes adjoining on every side, would probably eclipse his labours. Could he, on the contrary, produce, amidst its magnificent wilds, one of those antiquated parterres, with its canals and fountains, whose precision he has learned to despise, his work would create admiration and delight. A pepper *garden* cultivated in England, would not, in point of external appearance, be considered as an object of extraordinary beauty, and would be particularly found fault with for its uniformity; yet, in Sumatra, I never entered one, after travelling many miles, as is usually the case, through the woods, that I did not find myself affected with a strong sensation of pleasure. Perhaps the simple view of human industry, so scantily presented in that island, might contribute to this pleasure, by awakening those social feelings that nature has inspired us with, and which make our breasts glow on the perception of whatever indicates the prosperity and happiness of our fellow-creatures.

Surveys.

Once in every year, a survey of all the pepper-plantations is taken by the Company's European servants, resident at the various settlements, in the neighbourhood of which that article is cultivated. The number of vines in each particular garden is counted; accurate observation is made of its state and condition; orders are given, where necessary, for further care, for completion of stipulated quantity, renewals, changes

of situation for better soil; and rewards and punishments are distributed to the planters, as they appear, from the degree of their industry or remissness, deserving of either. Minutes of all these are entered in the survey-book, which, beside giving present information to the chief, and to the governor and council, to whom a copy is transmitted, serves as a guide and check for the survey of the succeeding year. An abstract of the form of the book is as follows. It is divided into sundry columns, containing the name of the village; the names of the planters; the number of chinkareens planted; the number of vines just planted; of young vines, not in a bearing state, three classes or years; of young vines in a bearing state, three classes; of vines in prime; of those on decline; of those that are old, but still productive; the total number; and lastly the quantity of pepper received during the year. A space is left for occasional remarks, and at the conclusion is subjoined a comparison of the totals of each column, for the whole district or residency, with those of the preceding year. This business the reader will perceive to be attended with considerable trouble, exclusive of the actual fatigue of the surveys, which, from the nature of the country, must necessarily be performed on foot, in a climate not very favourable to such excursions. The journeys in few places can be performed in less than a month, and often require a much longer time.

The arrival of the Company's Resident at each *dusun* is considered as a period of festivity. The chief, together with the principal inhabitants, entertain him and his attendants with rustic hospitality, and when he retires to rest, his slumbers are soothed, or interrupted, by the songs of young females, who never fail to pay this compliment to the respected guest; and receive in return some trifling ornamental and useful presents (such as looking-glasses, fans, and needles) at his departure.

Succession of gardens.

The inhabitants, by the original contracts of the head men with the Company, are obliged to plant a certain number of vines; each family one thousand, and each young unmarried man five hundred; and, in order to keep up the succession of produce, so soon as their gardens attain to their prime state, they are ordered to prepare others, that they may begin

gin to bear as the old ones fall off; but as this can seldom be enforced, till the decline becomes evident, and as young gardens are liable to various accidents which older ones are exempt from, the succession is rendered incomplete, and the consequence is, that the annual produce of each district fluctuates, and is greater or less, in the porportion of the quantity of bearing vines to the whole number. To enter minutely into the detail of this business, will not afford much information or entertainment to the generality of readers, who will, however, be surprised to hear that pepper-planting, though scarcely an art, so little skill appears to be employed in its cultivation, has nevertheless been rendered an abstruse science, by the investigations which able men have bestowed upon the subject. These took their rise from censures conveyed for supposed mismanagement, when the investment, or annual provision of pepper, decreased in comparison with preceding years, and which was not satisfactorily accounted for by unfavourable seasons. To obviate such charges, it became necessary for those who superintended the business, to pay attention to, and explain the efficient causes which unavoidably occasioned this fluctuation, and to establish general principles of calculation, by which to determine at any time, the probable future produce of the different residencies. These will depend upon a knowledge of the medium produce of a determinate number of vines, and the medium number to which this produce is to be applied; both of which are to be ascertained only from a comprehensive view of the subject, and a nice discrimination. Nothing general can be determined from detached instances. It is not the produce of one particular plantation in one particular stage of bearing, and in one particular season; but the mean produce of all the various classes of bearing vines collectively, drawn from the experience of several years, that can alone be depended on in calculations of this nature. So in regard to the medium number of vines presumed to exist at any residency in a future year, to which the medium produce of a certain number, one thousand, for instance, is to be applied, the quantity of young vines of the first, second, and third year, must not be indiscriminately advanced, in their whole extent, to the next annual stage, but a judicious allowance, founded on experience, must be made, for the accidents to which, in spite of a resident's utmost care, they will be exposed. Some are lost by neglect or death of the

the owner; some are destroyed by inundations, others by elephants and wild buffaloes, and some by unfavourable seasons and from these several considerations, the number of vines will ever be found considerably decreased, by the time they have arrived at a bearing state. Another important object of consideration, in these matters, is the comparative state of a residency at any particular period, with what may be justly considered as its medium state. There must exist a determinate proportion between any number of bearing vines, and such a number of young as are necessary to replace them when they go off and keep up a regular succession. This will depend in general upon the length of time before they reach a bearing state, and during which they afterwards continue in it. If this certain proportion happens at any time to be disturbed, the produce must become irregular. Thus, if at any period, the number of bearing vines shall be found to exceed their just proportion to the total number, the produce, at such period, is to be considered as above the mean, and a subsequent decrease may with certainty be predicted, and *vice versâ*. If then this proportion can be known, and the state of population in a residency ascertained, it becomes easy to determine the true medium number of bearing vines in that residency.

There are, agreeably to the form of the survey book, eleven stages or classes of vines, each advanced one year. Of these classes, six are bearing, and five young. If, therefore, the gardens were not liable to accidents, but passed on from column to column undiminished, the true proportion of the bearing vines to the young would be as six to five, or to the total, as six to eleven. But the various contingences above hinted at, must tend to reduce this proportion; while, on the other hand, if any of the gardens should continue longer than is necessary to pass through all the stages on the survey-book, or should remain more than one year in a prime state, these circumstances would tend to increase the porportion. What then is the true medium proportion, can only be determined from experience, and by comparing the state of a residency at various successive periods. In order to ascertain this point, a very ingenious gentleman, and able servant of the East India Company,[a] to whom

[a] Mr. John Crisp.

whom I am indebted for the most part of what I have laid before the reader on this part of the subject, drew out, in the year 1777, a general comparative view of Manna residency, from the surveys of twelve years, annexing the produce of each year. From the statement it appeared, that the proportion of the bearing vines to the whole number, in that district, was no more than 5,1 to 11, instead of 6 to 11, which would be the proportion, if not reduced by accidents; and further, that when the whole produce of the twelve years was diffused over the whole number of bearing vines during that period, the produce of one thousand vines came out to be four hundred and fifty-three pounds, which must therefore be estimated as the medium produce of that residency. The same principle of calculation being applied to the other residencies, it appeared, that the mean annual produce of one thousand vines, in all the various stages of bearing, taken collectively throughout the country, deduced from the experience of twelve years, was four hundred and four pounds. It likewise became evident from the statements drawn out by that gentleman, that the medium annual produce of the Company's settlements on the west coast of Sumatra, ought to be estimated at twelve hundred tons, of sixteen hundred *weight*; which is corroborated by an average of the actual receipts for any considerable number of years.

Thus much will be sufficient to give the reader an idea of pepper-planting as a kind of science. How far, in a commercial light, this produce answers the Company's views in supporting the settlements, is foreign from my purpose to discuss, though it is a subject on which not a little might be said. It is the history of the island, and its inhabitants, and not of the European interests, that I attempt to lay before the public.

Species of pepper.

The natives distinguish three species of pepper, which are called at different places by different names. At *Laye*, in the *Rejang* country, they term them *lado kawur*, *lado manna*, and *lado jambi*, from the parts where each sort is supposed to prevail, or from whence it was first brought to them. The *lado kawur*, or *Lampong* pepper, is the strongest plant, and bears the largest leaf and fruit; is slower in coming to perfection

perfection than the second, but of much longer duration. The leaf and fruit of the *lado manna* are somewhat smaller, and it has this peculiarity, that it bears soon and in large quantities, but seldom passes the third or fourth year's crop. The *jambi*, which has deservedly fallen into disrepute, is of the smallest leaf and fruit, very short lived, and not without difficulty trained to the chinkareen. In some places to the southward they distinguish two kinds only, *lado sudul* and *lado jambi*. *Lado sulur* and *lado aïggor* are not distinctions of species; the former denoting the cuttings of young creeping shoots commonly planted, in opposition to the latter, which is the term for planting by layers.

Seasons. The season of the pepper-vines bearing, as well as that of most other fruits-trees on Sumatra, is subject to great irregularities, owing, perhaps, to the uncertainty of the monsoons, which are not there so strictly periodical, as on the western side of India. Generally speaking, however, the pepper produces two crops in the year; one called the greater crop (*pupul agung*) between the months of October and March; the other called the lesser or half crop (*buah sello*) between the months of April and September, which is small in proportion as the former has been considerable, and *vice versâ*. Sometimes, in particular districts, they will be employed in gathering it in small quantities, during the whole year round, whilst, perhaps, in others, the produce of that year is confined to one crop; for although the regular period between the appearance of the blossom and maturity is about four months, the whole does not ripen at once, and blossoms are frequently found on the same vine with green and ripe fruit. In *Laye* residency, the principal harvest of pepper, in the year 1766, was gathered between the months of February and May; in 1767 and 1768, about September and October; in 1778, between June and August; and for the four succeeding years was seldom received earlier than November and December. Long continued droughts, which sometimes happen, stop the vegetation of the vines, and retard the produce. This was particularly experienced in the year 1775, when, for a period of about eight months, scarcely a shower of rain fell to moisten the earth. The vines were deprived of their foliage; many gardens perished, and a general destruction was expected. But this apparent calamity was attended with a consequence not foreseen, though analogous

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to the usual operations of nature in that climate. The natives, when they would force a tree that is backward, to produce fruit, strip it of its leaves, by which means the nutritive juices are reserved for that more important use, and the blossoms soon begin to shew themselves in abundance. A similar effect was displayed in the pepper gardens, by the inclemency of the season. The vines, as soon as the rains began to descend, threw out blossoms in a profusion unknown before; old gardens, which had been unprolific for two or three years, began to bear; and accordingly the crop of 1776-7 considerably surpassed that of many preceding years.

Transportation of pepper.

The pepper is mostly brought down from the country on rafts (*rakit*), which are sometimes composed of rough timbers, but usually of large bamboos, with a platform of split bamboos, to keep the cargo dry. They are steered at both head and stern, in the more rapid rivers, with a kind of rudder, or scull rather, having a broad blade, fixed in a fork or crutch. Those who steer are obliged to exert the whole strength of the body, in those places especially where the fall of water is steep, and the course winding; but the purchase of the scull is of so great power, that they can move the raft bodily across the river, when both ends are acted upon at the same time. But, notwithstanding their great dexterity, and their judgment in chusing the channel, they are liable to meet with obstruction in large trees and rocks, which, from the violence of the stream, occasion their rafts to be overset, and sometimes dashed to pieces.

It is a generally received opinion, that pepper does not sustain any damage by an immersion in sea water; a circumstance that attends, perhaps, a fourth part of the whole quantity shipped from the coast. The surf, through which it is carried in an open boat, called a *sampan lonchore*, renders such accidents unavoidable. This boat, which carries one or two tons, being hauled up on the beach, and there loaded, is shoved off, with a few people in it, by a number collected for that purpose, who watch the opportunity of a lull, or temporary intermission of the swell. A *tambañgan*, or long narrow vessel, built to contain from ten to twenty tons, (peculiar to the southern part of the coast) lies at anchor without, to receive the cargoes from the sampans. At many places,

where the *kwallas*, or mouths of the rivers, are tolerably practicable, the pepper is sent out at once in the *tambangans* over the bar; but this, owing to the common shallowness of the water, and violence of the surfs, is attended with considerable risk. Thus the pepper is conveyed, either to the warehouses at the head-settlement, or to the ship from Europe lying there to receive it. About one-third part of the quantity of black pepper collected, but none of the white, is annually sent to China. Of the extent and circumstances of the trade in pepper carried on by private merchants (chiefly American) at the northern ports of *Nalabu*, *Susu*, and *Mukki*, where it is managed by the subjects of *Achin*, I have not any accurate information, and only know that it has increased considerably during the last twelve years.

Nutmegs and cloves.

It is well known with what jealousy and rigour the Batavian government has guarded against the transplantation of the trees producing nutmegs and cloves from the islands of *Banda* and *Amboina* to other parts of India. To elude its vigilance many attempts have been made by the English, who considered Sumatra to be well adapted, from its local circumstances, to the cultivation of these valuable spices; but all proved ineffectual, until the reduction of the eastern settlements in 1796, afforded the wished for opportunity, which was eagerly seized by Mr. Robert Broff, at that period chief of the Residency of Fort Marlborough. As the culture is now likely to become of importance to the trade of this country, and the history of its introduction may hereafter be thought interesting, I shall give it in Mr. Broff's own words. "The acquisition of the nutmeg and clove plants became an object of my solicitude the moment I received by Capt. Newcombe, of his Majesty's ship Orpheus, the news of the surrender of the islands where they are produced; being convinced, from the information I had received, that the country in the neighbourhood of Bencoolen, situated as it is in the same latitude with the Moluccas, exposed to the same periodical winds, and possessing the same kind of soil, would prove congenial to their culture. Under this impression I suggested to the other members of the Board the expediency of freighting a vessel for the two-fold purpose of sending supplies to the forces at Amboina, for which they were in distress, and of bringing in return as many spice-plants as could be conveniently stowed. The proposition

proposition was acceded to, and a vessel, of which I was the principal owner (no other could be obtained) was accordingly dispatched in July, 1806; but the plan was unfortunately frustrated by the imprudent conduct of a person on the civil establishment, to whom the execution was entrusted. Soon afterwards, however, I had the good fortune to be more successful, in an application I made to Capt. Hugh Moore, who commanded the Phœnix country ship, to undertake the importation; stipulating with him to pay a certain sum for every healthy plant he should deliver. Complete success attended the measure: he returned in July, 1798, and I had the satisfaction of planting myself, and distributing for that purpose, a number of young nutmeg and a few clove trees, in the districts of Bencoolen and *Silebar*, and other more distant spots, in order to ascertain from experience the situations best adapted to their growth. I particularly delivered to Mr. Charles Campbell, botanist, a portion to be under his own immediate inspection; and another to Mr. Edward Coles, this gentleman having in his service a family who were natives of a spice island, and had been used to the cultivation. When I quitted the coast in January, 1799, I had the gratification of witnessing the prosperous state of the plantations, and of receiving information from the quarters where they had been distributed, of their thriving luxuriantly; and since my arrival in England various letters have reached me, to the same effect. To the merit, therefore, of introducing this important article, and of forming regulations for its successful culture, I put in my exclusive claim; and am fully persuaded that if a liberal policy is adopted, it will become of the greatest commercial advantage to the Company and to the nation."

First introduction.

Further light will be thrown upon this subject, and the progress of the cultivation, by the following extract of a letter to me from Mr. Campbell, dated in November, 1803. "Early in the year 1798, Mr. Broff, to whom the highest praise is due for his enterprising and considerative scheme of procuring the spice trees from our newly-conquered islands (after experiencing much disappointment and want of support) overcame every obstacle, and we received, through the agency of Mr. Jones, commercial resident at *Amboina*, five or six hundred nutmeg plants, with about fifty cloves; but these latter were not in a vigorous state. They

were distributed, and put generally under my inspection. Their culture was attended with various success, but Mr Coles, from the situation of his farm, near *Silebar* River, but not too close to the sea-shore, and from, I believe, bestowing more personal attention than any of us, has outstripped his competitors. Some trees which I planted as far inland as the Sugar-loaf Mountain, blossomed with his, but the fruit was first perfected in his ground. The plants were dispatched from Amboina in March, 1798, just bursting from the shell, and two months ago I plucked the perfect fruit, specimens of which I now send you; being a period of five years and nine months only; whereas in their native land eight years at least are commonly allowed. Having early remarked the great promise of the trees, I tried by every means in my power to interest the Bengal government in our views, and at length, by the assistance of Dr. Roxburgh, I succeeded. A few months ago his son arrived here from Amboina, with twenty-two thousand nutmeg plants, and upwards of six thousand cloves, which are already in my nurseries, and flourishing like those which preceded them. About the time the nutmegs fruited, one clove tree flowered. Only three of the original importation had survived their transit and the accidents attending their planting out. Its buds are now filling, and I hope to transmit specimens of them also. The Malay chiefs have eagerly engaged in the cultivation of their respective shares. I have retained eight thousand nutmegs as a plantation, from which the fruit may hereafter be disseminated. Every kind of soil, and every variety of situation, has been tried. The cloves are not yet widely dispersed, for being a tender plant, I chuse to have them under my own eye." Since the death of Mr. Campbell, Mr. Roxburgh has been appointed to the superintendance, and the latest accounts from thence justify the sanguine expectations formed of the ultimate importance of the trade; there being at that period upwards of twenty thousand nutmeg trees in full bearing, capable of yielding annually two hundred thousand pounds weight of nutmegs, and fifty thousand pounds of mace. The clove plants have proved more delicate, but the quality of their spice equal to any produced in the Moluccas. It is understood, that the Company has declined the monopoly of the trade, and left the cultivation to individual exertion; directing, however, that its own immediate plantations be kept up by the labour of convicts from Bengal, and

Second importation of plants.

Culture left to individuals.

and reserving to itself an export duty of ten per cent. on the value of the spices.

Among the valuable productions of the island as articles of commerce, a conspicuous place belongs to the camphor. Camphor.

This peculiar substance, called by the natives *kapūr-bārus*, and distinguished by the epithet of native camphor from another sort which shall be mentioned hereafter, is a drug for which Sumatra and Borneo have been celebrated from the earliest times, and with the virtues of which the Arabian physicians appear to have been acquainted. Chemists formerly entertained opinions extremely discordant in regard to the nature and the properties of camphor; and even at this day they seem to be but imperfectly known. It is considered, however, as a sedative and powerful diaphoretic: but my province is to mention such particulars of its history as have come within my knowledge, leaving to others to investigate its most beneficial uses.

The tree is a native of the northern parts of the island only, not being found to the southward of the line, nor yet beyond the third degree of N. latitude. It grows, without cultivation, in the woods lying near to the sea-coast, and is equal in height and bulk to the largest timber trees, being frequently found upwards of fifteen feet in circumference. For carpenters' purposes the wood is in much esteem, being easy to work, light, durable, and not liable to be injured by insects, particularly by the *kumbang*, a species of the bee, whose destructive perforations have been already mentioned; but is also said to be more affected than most others by the changes of the atmosphere. The leaf is small, of a roundish oval, the fibres running straight and parallel to each other, and terminates in a remarkably long and slender point. The flower has not yet been brought to England. The fruit is described by C. F. Gaertner (De Seminibus, Place of growth. Wood.

* The word *kapūr* appears to be derived from the Sanskrit *karpūra*, and the Arabic and Persian *kāfūr* (from whence our *camphor*), to have been adopted from the language of the country where the article is produced. *Bārus* is the name of a place in Sumatra.

Seminibus, Vol. III. p. 49. tab. clxxxvi.) by the name of *Dryobalanops aromatica*, from specimens in the collection of Sir Joseph Banks; but he has unaccountably mistaken it for the cinnamon tree, and spoken of it as a native of Ceylon. It is also described, from the same specimens, by M. Corréa de (Serra Annales du Muséum d' Histoire Naturelle, Tom. X. p. 159. pl. 8.) by the name of *Pterigium teres;* without any reference whatever to the nature of the tree as yielding this valuable drug. A beautiful engraving of its very peculiar foliage has been made under the direction of Mr. A. B. Lambert.

Camphor found in the fissures.

The camphor is found in the concrete state in which we see it, in natural fissures or crevices of the wood, but does not exhibit any exteriour appearance by which its existence can be previously ascertained, and the persons whose employment it is to collect it, usually cut down a number of trees, almost at random, before they find one that contains a sufficient quantity to repay their labour, although always assisted in their research by a professional conjurer, whose skill must be chiefly employed in concealing or accounting for his own mistakes. It is said, that not a tenth part of the number felled is productive either of camphor or of camphor-oil (*mēniak kapur*), although the latter is less rare; and that parties of men are sometimes engaged for two or three months together in the forests, with very precarious success. This scarcity tends to enhance the price. The tree, when cut down, is divided transversely into several blocks, and these again are split with wedges into small pieces, from the interstices of which the camphor, if any there be, is extracted. That which comes away readily in large flakes, almost transparent, is esteemed the prime sort or head; the smaller, clean pieces are considered as belly, and the minute particles, chiefly scraped from the wood, and often mixed with it, are called foot; according to the customary terms adopted in the assortment of drugs. The mode of separating it from these and other impurities, is by steeping and washing it in water, and sometimes with the aid of soap. It is then passed through sieves or screens of different apertures, in order to make the assortment, so far as that depends upon the size of the grains; but much of the selection is also made by hand, and particular care is taken to distinguish from the

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more genuine kinds, that which is produced by an artificial concretion of the essential oil.

The inquiries I formerly made on the subject (not having been myself in the district where the tree grows) led me to believe with confidence that the oil, and the dry crystallized resin were not procured from the same individual tree; but in this I was first undeceived by Mr. R. Maidman, who, in June 1788, wrote to me from *Tappanuli*, where he was resident, to the following effect: "I beg your acceptance of a piece of camphor wood, the genuine quality of which I can answer for, being cut by one of my own people, who was employed in making charcoal, of which the best for smiths' work is made from this wood. On cutting deep into a pretty large tree, the fine oil suddenly gushed out, and was lost for want of a receiver. He felled the tree, and having split it, brought me three or four catties (four or five pounds) of the finest camphor I ever saw, and also this log, which is very rich. My reason for being thus particular is, that the country people have a method of pouring oil of inferior camphor trees into a log of wood that has natural cracks, and by exposing this to the sun every day for a week, it appears like genuine camphor; but is the worst sort." This coexistence of the two products has been since confirmed to me by others, and is particularly stated by Mr. Macdonald in his ingenious paper on certain "Natural Productions of Sumatra" published in the Asiat. Res. Vol. IV. Calcutta 1795. It seems probable on the whole, that as the tree advances in age, a greater proportion of this essential oil takes a concrete form, and it has been observed to me, that when the fresh oil has been allowed to stand and settle, a sediment of camphor is procured; but the subject requires further examination by well informed persons on the spot. Camphor oil.

Head camphor is usually purchased from those who procure it, at the rate of six Spanish dollars the pound, or eight dollars the catty, and sells in the China market at Canton for nine to twelve dollars the pound, or twelve to fifteen hundred dollars the *pekul* of a hundred catties or one hundred thirty-three pounds and a third, avoirdupoise. When of superior quality it sells for two thousand dollars, and I have been Price.

been assured, that some small, choice samples, have produced upwards, of thirty dollars per catty.[a] It is estimated that the whole quantity annually brought down for sale, on the western side of the island, does not exceed fifty pekul. The trade is chiefly in the hands of the Achinese settled at *Sinkell*, who buy the article from the *Batta* people, and dispose of it to the Europeans and Chinese settlers.

Japan camphor.

It has been commonly supposed that the people of China or Japan prepare a factitious substance resembling native camphor, and impregnated with its virtues by the admixture of a small quantity of the genuine, which is sold to the Dutch factory for thirty or forty dollars the pekul, sent to Holland, and afterwards refined to the state in which we see it in our shops, where it is sold at eight to twelve shillings the pound. It appears, however, an extraordinary circumstance, that any article could possibly be so adulterated, bearing at the same time the likeness and retaining the sensible qualities of its original, as that the dealers should be enabled, with profit to themselves to re-sell it for the fiftieth part of the price they gave. But upon inquiry of an ingenious person long resident in China, I learned that the Japan camphor is by no means a factitious substance, but the genuine produce of a tree growing in abundance in the latter country, different in every character from that of Sumatra or Borneo, and well known to our botanists by the name of laurus camphora, L. He further informed me that the Chinese never mix the Sumatran camphor with that from Japan, but purchase the former for their own use, at the before-mentioned extravagant price, from an idea of its efficacy, probably superstitious, and export the latter as a drug not held in any particular estimation. Thus we buy the leaves of their tea-plant, at a high rate, and neglect herbs, the natives of our own soil, possessing perhaps equal virtues. It is known

[a] See Price Currents of the China trade. Camphor was purchased in Sumatra by Commodore Beaulieu, in 1622, at the rate of fifteen Sp. dol. for twenty eight ounces, which differs but little from the modern price. In the Trans. of the Society at Batavia, it appears that the camphor of Borneo sells in their market for 3200 rix dollars, and that of Japan for 50 rix dollars the pekul.

known also that the Japan camphor, termed factitious, will evaporate till it wholly disappears, and at all stages of its diminution retain its full proportion of strength; which does not seem the property of an adulterated or compounded body. Kæmpfer informs us that it is prepared from a decoction of the wood and roots of the tree, cut into small pieces; and the form of the lumps in which it is brought to us shews that it has undergone a process. The Sumatran sort, though doubtless from its extreme volatility it must be subject to decrease, does not lose any very sensible quantity from being kept, as I find from the experience of many years that it has been in my possession. It probably may not be very easy to ascertain its superiority over the other in the *materia medica*, not being brought for sale to this country, nor generally administered; but from a medical person who practised at Bencoolen, I learned that the usual dose he gave was from half a grain to one or two grains at the most. The oil, although hitherto of little importance as an article of commerce, is a valuable domestic medicine, and much used by the natives as well as Europeans, in cases of strains, swellings, and rheumatic pains; its particles, from their extreme subtilty, readily entering the pores. It undergoes no preparation, and is used in the state in which, upon incision, it has distilled from the tree. The *kayu putih* (melaleuca leucadendron) oil, which is somewhat better known in England, is obtained in the same manner; but to procure the *meniak kayu* or common wood-oil, used for preserving timber or boards exposed to the weather, from decay, and for boiling with dammar to pay the bottoms of ships and boats, the following method is practised. They make a transverse incision into the tree, to the depth of some inches, and then cut sloping down from the notch, till they leave a flat superficies. This they hollow out to a capacity to receive about a quart. They then put into the hollow a bit of lighted reed, and let it remain for about ten minutes, which acting as a stimulus, draws the fluid to that part. In the space of a night the liquor fills the receptacle prepared for it, and the tree continues to yield a lesser quantity for three successive nights, when the fire must be again applied: but on a few repetitions it is exhausted.

Benzoin.

Benzoin or Benjamin (styraz benzoin[a]) called by the Malays *kaminian*, is, like the camphor, found almost exclusively in the Batta country, to the northward of the equator, but not in the Achinese dominions immediately beyond that district. It is also met with, though rarely, south of the line, but there, either from natural inferiority or want of skill in collecting it, the small quantity produced is black and of little value. The tree does not grow to any considerable size, and is of no value as timber. The seeds or nuts, which are round, of a brown colour, and about the size of a moderate bolus, are sown in the *padi*-fields, and afterwards require no other cultivation than to clear away the shrubs from about the young plants. In some places, especially near the sea-coast, large plantations of it are formed, and it is said that the natives, sensible of the great advantage accruing to them from the trade, in a national point of view, oblige the proprietors, by legal regulation, to keep up the succession.

Mode of procuring it.

When the trees have attained the age of about seven years, and are six or eight inches in diameter, incisions are made in the bark, from whence the balsam or gum (as it is commonly termed, although being soluble in spirits and not in water, it is rather a resin) exudes, which is carefully pared off. The purest of the gum, or Head benzoin, is that which comes from these incisions during the first three years, and is white, inclining to yellow, soft, and fragrant; after which it gradually changes to the second sort, which is of a reddish yellow, degenerating to brown; and at length when the tree, which will not bear a repetition of the process for more than ten or twelve years, is supposed to be worn out, they cut it down, and when split in pieces procure, by scraping, the worst sort, or Foot benzoin, which is dark coloured, hard, and mixed more or less with parings of the wood and other impurities. The Head is further distinguished into Europe and India-head, of which the first is superior, and is the only sort adapted to the home-market: the latter, with most of the inferior sorts, is exported to Arabia,

[a] See a Botanical Description of this tree by my friend Mr. Jonas Dryander, with a plate, in Vol. LXXVII. p. 307. of the Phil. Trans. for the year 1787.

bia,[a] Persia, and some parts of India, where it is burned, to perfume with its smoke their temples and private houses, expel troublesome insects, and obviate the pernicious effects of unwholesome air or noxious exhalations; in addition to which uses, in the Malayan countries, it is always considered as a necessary part of the apparatus in administering an oath. It is brought down from the country for sale in large cakes, called *tampang*, covered with mats; and these, as a staple commodity, are employed in their dealings for a standard of value, to which the price of other things have reference, as in most parts of the world to certain metals. In order to pack it in chests, it is necessary to soften the coarser sorts with boiling water; for the finer, it is sufficient to break the lumps and to expose it to the heat of the sun. The greater part of the quantity brought to England is re-exported from thence to countries where the Roman Catholic and Mahometan religions prevail, to be there burnt as incense in the churches and temples.[b] The remainder is chiefly employed in medicine, being much esteemed as an expectorant and styptic, and constitutes the basis of that valuable balsam distinguished by the name of Turlington, whose very salutary effects, particularly in healing green and other wounds, is well known to persons abroad who cannot always obtain surgical assistance. It is also employed, if I am not misinformed, in the preparation of court sticking plaister. The gum or resin called *dulang* is named by us scented benzoin from its peculiar fragrance. The *rasamala* (lignum papuanum of Rumphius, and altingia excelsa of the Batavian Trans.) is a sort of wild benzoin, of little value, and not, in Sumatra, considered as an object of commerce.

Cassia

[a] Les Arabes tirent beaucoup d'autres sortes d'encens de l' *Habbesch*, de *Sumatra*, *Siam*, *Java*, &c. et parmi celles-là une qu'ils appellent *Bachôr* (bakhôr) *Java*, & que les Anglois nomment Benzoin, est très-semblable à l' *Olibân*. On en exporte en grande quantité en Turquie parles golfes d'Arabie & de Perse, & la moindre des trois espèces de Benzoin, que les marchands vendent, est estimée meilleure que l'Olibân d'Arabie. Niebuhr, Description de l'Arabie, p. 126.

[b] According to Mr. Jackson the annual importation of Benzoin at *Mogodor*, from London, is about 13,000 lb. annually.

Cassia. Cassia or *kulit manis* (laurus cassia) is a coarse species of cinnamon which flourishes chiefly, as well as the two foregoing articles, in the northern part of the island; but with this difference, that the camphor and benzoin grow only near the coast, whereas the cassia is a native of the central parts of the country. It is mostly procured in those districts which lie inland of *Tapanuli*, but it is also found in *Mesi*, where *Palembang* River takes its rise. The leaves are about four inches long, narrower than the bay (to which tribe it belongs) and more pointed; deep green; smooth surface, and plain edge. The principal fibres take their rise from the peduncle. The young leaves are mostly of reddish hue. The blossoms grow six in number upon slender foot-stalks, close to the bottom of the leaf. They are monopetalous, small, white, stellated in six points. The stamina are six, with one stile, growing from the germen, which stands up in three brownish segments, resembling a cup. The trees grow from fifty to sixty feet high, with large, spreading, horizontal branches, almost as low as the earth. The root is said to contain much camphor, that may be obtained by boiling or other processes unknown on Sumatra. No pains is bestowed on the cultivation of the cassia. The bark, which is the part in use, is commonly taken from such of the trees as are a foot or eighteen inches diameter, for when they are younger, it is said to be so thin, as to lose all its qualities very soon. The difference of soil and situation alters considerably the value of the bark. Those trees which grow in a high, rocky soil, have red shoots, and the bark is superior to that which is produced in a moist clay, where the shoots are green. I have been assured by a person of extensive knowledge, that the cassia produced on Sumatra, is from the same tree which yields the true cinnamon, and that the apparent difference arises from the less judicious manner of quilling it. Perhaps the younger and more tender branches should be preferred; perhaps the age of the tree, or the season of the year, ought to be more nicely attended to; and lastly, I have known it to be suggested, that the mucilaginous slime which adheres to the inside of the fresh peeled rind, does, when not carefully wiped off, injure the flavour of the cassia, and render it inferior to that of the cinnamon. I am informed that it has been purchased by Dutch merchants at our India sales, where it sometimes sold to much loss, and afterwards by them shipped for