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THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

EDITED BY

J. R. LOGAN, F. G. S.

Member of the Asiatic Society, Corresponding Member of the Ethnological Society of London, and of the Batavian Society of Arts and Sciences.

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ON THE HABITUAL USE OF OPIUM IN SINGAPORE.

By R. Little, Esq. Surgeon,

Late Demonstrator of Anatomy at the Argyle Square School of Medicine, Edinburgh, &c.

CHAPTER I.

INTRODUCTION.—HISTORY, VARIETIES, AND PREPARATION OF OPIUM.

The subject of this paper is one which, in spite of the imperfect manner in which it may be handled, ought to claim the serious attention of all.

It has, up to the present moment, engaged the attention of the Government, in so far only as it affords facilities for raising money; and the Public in general, whether residents here, or passing strangers, have looked on the miserable devotees to the vice of Opium smoking in the same light, and visited their abodes with the same curiosity, as they would have done a den of wild beasts, or a raving lunatic's cell. They enter the Opium shop, by pushing aside a filthy mat, and, in a small space, they see many men crowded and crouching on a narrow board; dim lights faintly disclose their squalid appearance; the air is impregnated with a close suffocating odour; the heat is oppressive;—a few questions are asked by the visitor, a pipe is shown, a human being gazed upon as he slowly and, to all appearance, with much gusto, inhales the sedative vapours;—at last, unable to endure it any longer, a rush is made by the visitor to the door, and, according to his preconceived

opinion, what has been seen is either a blot as black as Erebus, a canker eating into the vitals of society, a moral curse attended with great and deep physical evils, which are slowly, but surely, extending; or it may be looked upon as one way of spending money, not a bad plan for raising the revenue, a lighter curse than dram drinking and a far pleasanter, where the young men dream dreams, and the old men see sights. But let the philanthropist pass from house to house, mark the appearance of the visitors, pursue them to their homes, when, reeling from the effects of the drug, they, heedless of wife or children, pass into a disturbed sleep, to waken to the tortures of the damned when the sun is high up in the horizon, and the industrious of their fellow creatures have been at work for hours: this is the moment they appreciate their wretchedness, when feverish and hot, with a tongue that is dry, yet cannot be moistened, lips that are cracked, yet cannot be softened, a throat parched and thirst excessive, that cannot be quenched, with eyes either closed or running with rheum, a tightness of the chest that prevents breathing, a lassitude, a langour, a pain in all the bones, a downright incapability of exertion, a loathing of food and a craving for one thing only, which, not to attain is worse than death,—and that is another draught of the poison, which soothes for the moment, but clenches the faster the misery of the wretches. No overdrawn picture is this, but sketched from life, yea more, by the victims themselves, and of these victims there at least 15,000 in Singapore. Surely the importance of the subject will not now be questioned, and a little attention can safely be claimed to the particulars which have justified me in making the above momentous statement.

Opium is the inspissated juice of the white poppy, obtained by scratching the capsules, and collecting the exuding juice. The plant has been long known and is perhaps one of the earliest described. Homer speaks of the Poppy growing in gardens; and it was employed in medicine by Hippocrates, the father of physic, who even particularizes two kinds, the black and the white, and used the extract or Opium so extensively as to be condemned by his contemporary Diagoras. Dioscorides and Pliny also make mention of it, and from their time it

has been so commonly used, as to be incorporated in all the materia medicas of subsequent medical writers. According to Dr. Royle, the Hemp may have been the substance referred to by Homer, as its use is very ancient, though its effects are very different from those of Opium,—the one being sedative, the other exciting. Hence the Hemp, known here as "bang," has been and is still used, when activity and excitement are required. The Hemp was used in Richard 1st. of England's time, as he nearly met with his death from a follower of the old man of the mountain,* who was a Hashshashan or person who indulges in the habit of using "Hashshash," a preparation of Hemp and other narcotics and still known in Egypt by that name.

Preparation.—In Asia Minor, men, women, and children, a few days after the flower falls from the poppies, proceed to the fields, and with a shell scratch the capsules, wait 24 hours, and collect the tears, which amount to two or three grains in weight from each capsule. These being collected are mixed with the scrapings of the shells, worked up with saliva and surrounded by dried leaves. It is then sold, but, generally speaking, not without being still more adulterated with cow's dung, sand, gravel, the petals of the flowers &c., Different kinds of Opium are known in the markets of Europe and Asia. The first in point of quality is the *Smyrna* known in commerce as the *Turkey* or *Levant*. It occurs in irregular, rounded, flattened masses, seldom exceeding two pounds in weight, and surrounded by leaves of a kind of sorrel. The quantity of Morphia said to be derived from average specimens is eight per cent.

Second. *Constantinople Opium*, two kinds of which are found in the market, one in very voluminous irregular cakes, which are flattened like the Smyrna; this is a good quality. The other kind is in small, flattened, regular cakes, from two, to two and a half inches in diameter, and covered with the leaves of the poppy; the quantity of morphia is very uncertain in this description of Opium, sometimes mounting as high as fifteen per cent, and sometimes descending as low as six, shewing the great variety in the quality of the drug.

* Our word "Assassin" is supposed by the learned to be derived from the word "Hashshashan."

Third. *Egyptian Opium* occurs in round flattened cakes, about three inches in diameter, and covered externally with the vestiges of some leaf. It is distinguished from the others by its reddish colour, resembling "socotrine Aloes." The quantity of morphia in this is inferior to the preceding. It has one quality which, when adulterated, ought to be known, that is a musty smell By keeping it does not blacken like the other kinds.

Fourth. *English Opium* is in flat cakes or balls enveloped in leaves. It resembles fine Egyptian Opium more than any other kind. Its colour is that of hepatic aloes, and in the quantity of morphia it is inferior to the preceding, but in the strength of the mass it is said by one of its most extensive cultivators to be superior.

Fifth. *French*, and sixth, *German Opium*, require no particular remarks. By a recent notice, I find the French are cultivating the Poppy in Algeria from which they get opium giving a small percentage of morphia.

Seventh. *Trebizond* or *Persian Opium*, is sometimes met with of a very inferior quality in the form of cylindrical sticks, which by pressure have become angular.

Eighth. *Indian Opium*, divided into four kinds, Cutch, Malwa, Patna and Benares. Of these, Cutch is but little known or cultivated. It occurs in small cakes covered with leaves, and its colour is much inferior to Smyrna. Malwa Opium is to be met with of two kinds. The inferior is in flattened cakes, without any external covering, dull, opaque, blackish brown externally, internally somewhat darker, and soft. Its colour is somewhat like the Smyrna, but less powerful, and with a slight smoky smell. Superior Malwa is in square cakes about three inches in length, and one inch thick. It has the appearance of a well prepared, shining, dry, pharmaceutical extract; its colour is blackish brown, its odour less powerful then Smyrna; it is not covered by petals as the following kinds are, but smeared with oil; it is then rubbed with pounded petals.

The Behar, Patna and Benares Opium being strictly in the hands of Government, no adulteration can take place without a

most extensive system of fraud;* but it will not be uninteresting to trace the progress of the Opium from the hands of the natives to the condition in which it is delivered to the public by the Government.

From the commencement of the hot season to the middle of the rains the Government is ready to receive Opium, which is brought by the natives every morning, in batches varying in quantities from twenty seers to a maund. The examining officer into each jar thrusts his examining rod, which consists of a slit bamboo, and by experience he can so judge of the qualities of the specimens before him, which are sorted into lots of No. 1 to No. 4 quality. Opium of the first quality is of a fine chesnut color, aromatic smell, and dense consistence. It is moderately ductile, and, when the mass is torn, breaks with a deeply notched fracture, with sharp needle like fibres, translucent and ruby red at the edges. It is readily broken down under water, and the solution at first filters of a sherry colour, which darkens as the process proceeds. One hundred grains of this yield an extract to cold distilled water of from 35 to 45, and at the temperature of 212° leave from 20 to 28 per cent, having a consistence of 80 to 72, the consistence of the factory.

The second quality is inferior to the first, and the third quality is possessed of the following properties, black, pasty, of a very heavy smell, drops from the examining rod, gives off from 40 to 50 per cent of moisture, and contains a large quantity of "Pasewa," while the fourth or last number embraces all the kinds which are too bad to be used in the composition of the balls, comprising specimens of all varieties of colour and consistence. This number is mixed with water, and only used as a paste to cement the covering of the balls.

* Lately I saw a Chinaman brought to the Police for fabricating Opium Balls. The imitation Balls were composed of a skin, or husk formed from the leaves of Madras tobacco, inside was sand, which was evidently intended to form the shape of the Balls till the outer covering had sufficiantly set. The whole was neatly "served" with bandages of Calico, which would be removed when the tobacco was able to retain the proper shape; the sand would then be abstracted, and a mixture of Gambier and Opium substituted; while the outside would be rubbed over with a watery solution of Chandu. By these means the native traders are much and often imposed upon.

The three first qualities are emptied from their jars into large tanks, in which they are kept until the supply of the season has been obtained. The opium is then removed and exposed to the air on shallow wooden frames, until it becomes of the consistency of from 69 to 70, when it is given to the cake maker, who guesses to a drachm the exact weight, and envelopes the opium in its covering of petals, cemented by a covering of quality No. 4. The balls are then weighed and stored, to undergo a thorough ventilation and drying. Formerly the covering of the balls was composed of the leaves of Tobacco; but the late Mr. Flemming introduced the practise of using the petals of the poppy, which was such an improvement that the Court of Directors presented him with 50,000 Rupees. The balls, forty in number, are packed in a mango wood case, which consists of two stories with twenty pigeon holes in each, lined with lath and surrounded by the dried leaves of the poppy. Sometimes these balls are so soft as to burst their skins, and much of the liquid Opium running out is lost. In 1823 many of the chests of Patna lost 5 catties from this cause, and to this day we have the same thing continuing to occur. Patna chests are covered with Bullock hides, Benares with gunnies.

CHAPTER II.

THE FIRST USE OF OPIUM IN THE INDIAN ARCHIPELAGO AND CHINA.

We have already seen that Opium as a medicine has been used from the earliest ages; but when it was first resorted to us a luxury it is impossible to state, tho it is not at all improbable that this was coeval with its employment in medicine, for how often do we find, that from having been first administered as a sedative for pain, it has been continued, until it has itself taken the place of the evil. Such must have happened from the earliest ages, as it happens daily in the present; but as a national vice it was not known until the spread of Islamism, when, by the tenets of the Prophet, wine and fermented liquors being prohibited, it came in their stead, along with the bang or hashshash, coffee and tobacco.

From the Arabs the inhabitants of the Eastern Archipelago most probably imbibed their first prediliction for Opium, although their particular manner of using it has evidently been derived from the Chinese. I have not, in my limited researches, been able to observe any notice prior to that of Dampier's, though, from what he states, the use of Opium in his time was great and widely extended, and could not therefore have been recently acquired. Dampier states that in 1688 he took in at Acheen from 3 to 400 pounds of opium to trade with at Malacca, where he disposed of it privately, as it was prohibited. From Malacca he says ships were accustomed to take it to the different Malay states, and exchange it for pepper, and other articles of produce.

China, where at present it is extensively used, cannot be said to have indulged long in the vice; all the early writers on that country are silent as to its use, except in medicine. "Opium is in truth a "medicine, and properly it animates, purifies the breath, and dispels "noxious vapours, its nature is very clearly explained in the work "of Lina chin. He calls this herb the internal support." During the reign of the Emperor Kien Lung, who reigned from 1733 to 1796, a tarrif was regularly established, and the duty fixed at three taels for 100 catties, and 2 taels, 4 mace and 5 candarines for fees. Previous to 1767 the number of chests imported did not exceed two hundred yearly. In 1773 the East India Company made their first venture in Opium, and in 1796 it was declared a crime to smoke Opium: since then, in spite of pains and penalties, edicts, and warnings, the consumption has increased, until in 1837 it had reached the enormous extent of 40,000 chests, valued at twenty five millions of Dollars. From the rapid increase within the last eighty years, it is but fair to conjecture that the use of the drug was, previous to that time, limited to medical purposes, and that, however long it may have been cultivated in the Chinese Province of Yunnan, its use was far from universal. Even in that province the cultivation must have been limited, as Major Burney, in a letter dated Ava, 1831, says, "I examined several of the Caravans and they assured me that the "Poppy plant has been cultivated for the last eight or ten years at

" a place called Medoo two days journey from Tallee, a city of the " first order in Yunnan ; but that the cultivation is limited and carri- " ed on secretly, for if the Government of Pekin became aware of it, " they would lose their heads. In Ava this Chinese Opium sells for " 30 to 40 Rupees for $3\frac{1}{10}$ pounds.

The limits of this paper will not allow me to make further mention of the use of the drug in the Celestial Empire; but I would refer the curious to Montgomery Martins' work on China, where he will see it ably and eloquently discussed.

CHAPTER III.

PROVISIONS OF THE OPIUM REGULATIONS FOR SINGAPORE AND HONGKONG.

PREPARATION OF CHANDU IN SINGAPORE.

In Singapore opium in smaller quantity than one chest is not permitted to be sold; neither can it be used by individuals in the state of Chandu, unless the opium has previously passed through the hands of the individual permitted by Government to have the monopoly, who consequently charges a very heavy per centage on the original cost. This individual is called the " Opium Farmer," and he farms or rents from Government the exclusive power of retailing the drug, for which right he pays a large monthly sum. In this way, two purposes are served, first a large revenue is obtained, and secondly by enhancing the value the actual amount of the drug consumed is diminished, and the evil is thus circumscribed. It is to be supposed that the last consideration had considerable weight with the authorities when they established the Opium Farm. The idea of farming and renting the exclusive right of selling is a remnant of the olden times, and was adopted in Pinang and Bencoolen long before the occupation of Singapore, although it seems to have been originally derived from the Dutch. The Opium farm was established in Singapore in 1820; but the accounts of the sale of the farm are not recorded previous to 1822. The following is an abstract of the existing opium regulation passed in 1830.

Section 2d. Reg. 5, of 1825 is rescinded.

Section 3d. The exclusive right of preparing opium for smoking and retailing opiumin smaller quantities than one chest in the Straits Settlements, shall be vested in such person or persons as the Honorable the Governor in Council may be pleased to license for that purpose, on certain conditions, to be determined at public sale, or by private agreement."

Section 4th. " No person or persons, save and except the person or persons duly licensed by Government, or their officers duly authorised, shall prepare opium for smoking, or import opium prepared elsewhere or sell or purchase Opium not prepared by the person or persons duly licensed under this regulation [For all of which there is no penalty.] But " if any opium so prepared be found in the possession of any person, unless duly proved to have been prepared and purchased from the licensed renter or agent of Government, such person shall be subject on conviction before two Magistrates to the fine and punishments hereafter described.—viz. for first offence Rs. 500, every subsequent offence Rs. 1000, to be commuted in case of non-payment to confinement and hard labour in irons for 6 months in the first case, for 12 months in the second, and two years in all subsequent cases, and the opium so found in the houses, or places of abode, or any way in the possession of persons so convicted, as also the utensils for preparing opium, shall be subject to seizure &c."

Section 5th. " All persons found selling opium in smaller quantities, than one chest, save and except for exportation in the manner prescribed in Section xii. shall on conviction be liable to the fines and forfeitures and punishments of Section 4."

Clause 2d. "The importation of unprepared Opium in less quantities than one chest is hereby prohibited, under forfeiture and penalties of 10 times the value of the opium."

Section 6th. Enacts that the number of Opium shops shall be determined by the Hon'ble the Governor in Council. Moreover such Houses shall adjoin the Street, and shall be open from day light until 9 at night during each day. At which hour they are to be shut and no more Opium sold under a penalty of Rs. 100.

Section 7th. Enacts that all persons who may be found smoking after 9 o'clock in any other house save and except their usual place of abode, shall forfeit Rs. 100 and the owner of the house the like.

Section 8th. No gambling shall be permitted in any Opium shop under a penalty of Rs. 100.

Section 9th. No person shall be admitted into any opium house with any kind of arms, weapons, or edged tools, and for every breach of this rule the holder of the house shall be liable to a fine of Rs. 100.

Section 10th, Opium not to be sold except for current Coin.

Section 11th. Riotous or quarrelsome persons to be delivered over to the Police.

Section 12th. Enacts that all persons desirous of selling Opium in less quantity that one chest shall cause it to be delivered to the purchaser in presence of the collector or his officer, who will grant a permit to ship it, what remains shall remain in the hands of the collector until other permits are given for shipment, the penalties the same as described in Clause 2d. Sec. 5.

Section 13th. Enacts that no Opium be allowed to be prepared in the Straits Settlements on board of any vessel under the penalties described in Section 4.

Section 14th. Enacts that no Opium shall be sold on board of any vessel in less quantity than one chest under the penalties described in Section 5; but this rule is not to prevent the destribution for use of ship's crew.

Section 15th. Enacts that the collector and his officers, and every person duly licensed to sell opium prepared and unprepared, shall be at liberty to repair on board of any vessel at anchor in the harbour of Prince of Wales' Island, Singapore and Malacca, or within 10 miles of the coast, for the purpose of searching for Opium illicitly prepared or retailed contrary to the provisions of this regulation, on obtaining a Search Warrant from a Magistrate to be issued on the oath of the public officer or "other person licensed, that to the best of their knowledge and belief such opium is on board the vessel."

Section 16th. Enacts that none but those licensed shall be allow-

ed to sell, Tye Chandoo or Opium Dross, under the penalties described in Section 4.

Section 17th. All person, employed in retailing or smoking Opium shall take out a license from the Collector.

So finishes the rules that authorise the smoking of Opium, and virtually encourage the vice, but enlarge the revenue. They are therefore taken as the basis for regulations anent the use of Opium at Hongkong, where Regulation I. enacts that no person not duly licenced by Government shall sell or retail opium for consumption in smaller quantity than one chest under a penalty for the first offence $ 100, second offence $ 250, and for every subsequent offence $ 500.

Rule. 2d. The number of houses shall be determined by his Excellency the Governor in Council, or by such public officer as may be duly authorised. Such houses ahall adjoin the Street and shall be open from day light until 10 o'clock at night during each day, except Sunday; (bare faced hypocricy, as if God was not the God of other days.) Penalties are attached to the infringement of this rule.

3d. Opium shall not be disposed of except for money.

4th. No persons shall be admitted with arms, weapons or edged tools.

5th. All riotous persons shall be handed over to the Police.

6th. Permits any person duly licensed to retail Opium, on obtaining a warrant, to board any vessel in search of Opium illicitly retailed.

7th. No person permitted within the limits of Hongkong to sell Tye Chandu, or Opium dross, under fines forfeitures and penalties of rule 1st.

9th. All persons in charge of Opium shops shall take out a license from the person duly licensed as aforesaid.

10th. Enacts that the penalties be levied by distress; but failing sufficient distress to be commuted to future imprisonment.

(Sigd.) J. T Davis.

"To which regulations," to use the words of Montgomery Martin, "I would dissent, because no Government ought to make private vice a source of public revenue."

In the preceding part of this paper I have generally traced the history of the drug, described, though not particularly, the various forms, it is met with in commerce, and slightly touched upon its introduction into China and the Eastern Archipelago. I will now more minutely examine it as used in Singapore. The kind of Opium that is here preferred is the Bengal, Patna and Benares, of which the Patna is esteemed to have the finest flavour. It is not however used in the state in which it is imported, but as an extract called Chandu, for the formation of which the Opium undergoes the following process.

Between 3 and 4 o'clock in the morning the fires are lighted. A chest is then opened by one of the officers of the establishment of the Opium Farmer, and the number of balls delivered to the workmen is proportioned to the demand. The balls are then divided into equal halves by one man, who scoops out with his fingers the inside or soft part, and throws it into an earthen dish, frequently during the operation moistening and washing his hands in another vessel, the water of which is carefully preserved. When all the soft part is carefully abstracted from the hardened skins or husks, these are broken up, split, divided, and torn, and thrown into the earthen vessel containing the water already spoken of, saving the extreme outsides which are not mixed with the others but thrown away, or sometimes sold to adulterate Chandu in Johore and the back of the Island.

The second operation is to boil the husks with a sufficient quanti- of water in a large shallow iron pot for such a length of time as may be requisite to break down thoroughly the husks and dissolve the Opium. This is then strained through folds of China paper, laid on a frame of basket work, and over the paper is placed a cloth. The strained fluid is then mixed with the Opium scooped out in the first operation, and placed in a large iron pot, when it is boiled down to the consistence of thickish treacle. In this second operation, the refuse from the straining of the boiled husk is again boiled in water, filtered through paper, and the filtered fluid added to the mass to be made into Chandu. The refuse is thrown outside and little attended to. It is dried and sold to the Chinese going to China for 3 to 5 dollars ℔ picul, who pound it, and adulterate good opium with

it. The paper that has been used in straining contains a small quantity of opium,—it is carefully dried and used medicinally by the Chinese in Haemorrhoids, Prolapsus Ani, and a few other complaints.

The third operation. The dissolved opium being reduced to the consistence of treacle is seethed over a fire of charcoal of a strong and steady, but not fierce temperature, during which time it is most carefully worked, then spread out, then worked up again and again by the superintending workman so as to expel the water, and at the same time avoid burning it. When it is brought to the proper consistence, it is divided into half a dozen lots, each of which is spread like a plaster on a nearly flat iron pot to the depth of from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, and then scored in all manner of directions to allow the heat to be applied equally to every part. One pot after another is then placed over the fire, turned rapidly round, then reversed, so as to expose the opium itself to the full heat of the red fire. This is repeated three times, the length of time requisite and the proper heat are judged of by the workman from the effluvium and the colour, and here the greatest dexterity is requisite, for a little more fire, or a little less would destroy the mornings work, or 300 or more dollars' worth of opium. The head workmen are men who have learned their trade in China, and, from their great experience, receive high wages.

The fourth operation consists in again dissolving this fired opium in a large quantity of water and boiling it in copper vessels, till it is reduced to the consistence of the Chandu used in the shops;—the degree of tenacity being the index of its complete preparation, which is judged of by drawing it out with slips of bamboo.

By this long process many of the impurities in the Opium are got rid of, and are left in the refuse thrown out, such as vegetable matter, a part of the resin and oil, with the extractive matter and a little narcotine. By the seething process the oil and resin are almost entirely dissipated, so that the Chandu or extract, as compared with the crude opium, is less irritating and more soporific. The quantity of Chandu obtained from the soft opium is about 75 per cent; but from the gross opium, that is including the opium and the husk, the proportion is not more than from 50 to 54 per cent, from 20 to 22 taels being the

quantity of Chandu obtained from one ball, although it is said the present Opium Farmer is able to procure 25.

The heat which the men endure during the fourth operation is very great, and can only be tolerated when custom has enured them to it. One man struck me as quite a character. From 3 in the morning till 10 in the forenoon, he stands before the boiling chaldron with a fan in one hand, and a feather in the other, by which he scoops off the scum that forms, while with the fan he prevents the fluid from boiling over. He never speaks, but is always smiling, nor does he move except to quench his thirst from a bucket of water placed beside him. His trowsers are his only article of dress, the floor his bed, a little rice his food. When his labour is finished his enjoyment is to drink arrack until he is insensible, from which he is wakened in the morning to his work. He has but one idea, and that is the prospect of getting drunk on his favovrite beverage, for his work is mechanically done and costs him not a thought, no more than it does the dog who turns the spit; but he smiles as he thinks of the revel for the night, and with his whole soul wrapped up in that fancied bliss, he heeds not the days that go by. He is a singular being, and in another country would be the inmate of a mad house.

CHAPTER IV.

MODES OF USING OPIUM, AND ITS IMMEDIATE EFFECTS.

In different countries we have Opium used in different ways. In Great Britain it is either used in the solid state made into pills, or in tincture in the common shape of Laudanum. Insidiously it is given to children under a variety of quack forms, such as Godfrey's cordial, &c. In India the pure opium is either dissolved in water, and so used, or rolled into pills. It is there a common practice to give it to children when very young by mothers who require to work, and cannot at the same time nurse their offspring. In China it is either smoked, or swallowed in the shape of *Tye*. In Bally it is first adulterated with China paper and then rolled up with the fibres of a particular kind of plantain. It is then inserted into a hole made at the end of a small bamboo and smoked. In Java and Sumatra it is often mixed

with sugar and the ripe fruit of the plantain. "In Turkey it is usually taken in pills, and those who do so avoid drinking any water after having swallowed them, as this is said to produce violent colic; but to make it more palatable, it is sometimes mixed with syrups or thickened juices; in this form, however it is less intoxicating and resembles mead. It is then taken with a spoon, or is dried in small cakes with the words "Mash Allah" the "Work of God" imprinted on them. When the dose of two or three drachms a day no longer produces the beatific intoxication so eagerly sought by the opiophagi, they mix the opium with Corosive sublimate, increasing the quantity of the latter till it reaches 10 grains a day. It then acts as a stimulant."

In addition to its being used in the shape of pills, it is frequently mixed with helebore, and hemp and forms a mixture known by the name of Madgoon, whose properties are different from that of opium, and may account, in a great measure, for the want of similitude in the effects of the drug on the Turk and the Chinese. In Singapore where we have every Eastern nation indulging in this luxury we have it consequently used in various ways. The native of India, fresh from his country, prefers the mode there in use, and swallows the soul soothing pill, while the Chinese, with a gusto that no worshipper of the meershaum can compete with, inhales the smoke not only into his mouth, but into his lungs, where it becomes breath of his breath, and where, retained, it acts on the nervous fibres that are spread over the extensive membrane which lines every cell of the lungs, until, exhaled through nose and mouth, yea even in some cases thro' ear and eye, it is replaced by another puff.

Nothing on earth can equal the apparent quiet enjoyment of the opium smoker. As he enters the miserable scene of his future ecstacy he collects his small change, the labour or begging, or theft of the day, with which he supplies himself with his quantity of Chandu. Then, taking the pipe which is furnished gratis, he reclines on a board covered with a mat, and, with his head resting on a wooden or bamboo pillow, he commences filling his pipe. As he entered his looks were the picture of misery, his eyes were sunk, his gait slouched, his step

trembling and his voice quivering, with a sallow cast of countenance and dull unimpressive eye. He who runs might have read that he is an opium smoker, and if he could read still deeper and dive below appearances, he would have pronounced him an opium sufferer. But now with pipe in hand, opium by his side, and a lamp before him, his eye already glistens, and his features soften in their expression, while he is preparing the coming luxury. At last it is ready, and the pipe being applied to the lamp, there is heard a soughing noise as, with a full and hearty pull, he draws in all that opium and air can give. Slowly is the inspiration relaxed, but not till all the opium that is in the pipe is consumed; then, allowing the vapour, impregnated with the narcotic influence, to remain in his chest until nature compels him to expire, he gently allows it to escape, seeming to grudge the loss of each successive exit, until all is gone, when, exhausted and soothed, he withdraws the pipe, reclines his head, and gives himself up to the first calming effect of the drug. His next attempt confirms the comfort, and now no longer does he complain of racking limbs, or aching bones, no longer does the rheum run from his eyes, and relaxed is the tightness of his chest as he dwells with fond affection on the inspiring pipe. His second pipe being finished, he can now look round and has time to gaze on what is going on; but his soul is still wrapt in the bliss that is anticipated from what remains of his allowance, for not until a third or a fourth whiff do the feelings of positive pleasure arise. Then is felt a lightness of the head, a tingling in every limb, the eyes seem to be enlarged, and the ears sharpened to hearing, an elasticity, an inclination to mount on high is experienced, all pains have gone and pleasure now remains. All weariness is left and freshness take its place. The loathing of food that was lately experienced is changed to a relish for what is piquant, and a great desire is frequently felt for some particular food. The tongue is now loosened and tells its tale, for whatever is secret becomes open, and what was intended for one becomes known to all. Still there is no excitement; but a calmness, soft, soothing and sedative. He dreams no dreams, nor thinks of the morrow; but, with a smile in his eye, he fills his pipe with the last

of his allowance. Slowly inhaling it, he seems to brighten up, the smile that was sparkling in his eye extends to other features, and his appearance is one of complete yet placid enjoyment. Presently the pipe is slowly displaced or drops by his side, his head if raised, is now laid on the pillow, feature after feature gives up its smile, the eye becomes glazed. Now droops the upper eyelid and falls the chin with the lower lip, deeper and deeper inspirations follow, all perception is gone, objects may strike the eye, but no sights are seen, sounds may fall on the ear, but no sensations are excited, and so he passes into sleep, disturbed and broken, from which the wretched being awakes to a full conception of his misery.

Before tracing the moral and physical evils resulting from the lengthened use of Opium, it will be as well to search into the details connected with the places where the drug is used. In the Island of Singapore, according to Section VI of the Opium regulation, the number of shops where the drug is to be consumed, is determined by the Governor in Council, a most satisfactory rule; but not acted up to. At present the number of Opium shops in town is limited to 45, and in the country to 6. Each has a red board which the vender ought to hang up outside his shop, with the No. as received by the Farmer. Hence their name is Pápán Mérá or red board, and the shops are known by that name among all classes of natives. They are scattered in all directions over the island; and wherever a number of Chinese are congregated, there you have one or more. The Farmer could not have hit on a better plan, for extending the consumption of this article, than he has done, by the manner in which Opium shops are permitted to exist. A man comes to him, generally previously known or now recommended, and says he wishes to establish a Pápán Mérá, which he gets, and pays 50 cents for the board. If the number of 45 is completed he does not require a board; but puts a mat in the place of a door by which an Opium shop is known to all, while the fact is anounced by an inscription in Chinese. He pays nothing for a license, nor does he enter into any securities; but he purchases a certain quantity of the Chandu, and, according to his facilities for selling it, so is the price. If the Opium shop is in town, and near

to where the Chinese artificers are clustered, then he pays a little less then $ 2 a tael. If at a little distance $ 1¾, still further from town $ 1. 60, then $ 1. 50. Nay it even descends to $ 1 a tael. The last is the price which will be paid by the Nacodah of a Chinese Junk, who takes a large quantity at a time, as two thirds of his crew are generally consumers, and the facility for illicit consumption is great. The proprietors of Opium Shops are expected to retail it to their customers at a little above the price at which they purchase the Chandu from the Opium Farmer. If in town they pay 110 fanams or 8 per cent less than $ 2 a tael, then they charge 12 fanams a cheen which is the one-tenth of a tael, to those who come to buy, or who use it in their premises. The Opium Farmer receives nothing from the owner of the Opium shop, nor does he pay him anything for furthering the extension of the use of the drug, further than the discount of 8 per cent allowed only in some cases. Neither do the Opium smokers pay more for it than they would if they purchased it from the Opium Farmer. How then does the owner of the Opium shop live? how does he pay his rent sometimes 10 or 15 dollars a month? maintain his wife and children and keep one or two coolies? He does all this on the refuse of the Chandu, the prepared extract of the Opium. This extract when consumed leaves a refuse consisting of charcoal, enpyreumatic oil, some of the salts of the Opium, and a part of the Chandu not consumed. Now one ounce of Chandu gives nearly half an ounce of this refuse called Tye or Tinco. This is smoked and swallowed by the poorer classes, who only pay half the price of Chandu for it. When smoked it yields a further refuse called Samshing, and this is even used by the still poorer, although it contains a very small quantity of the narcotic principle; the last is never smoked as it cannot furnish any smoke, but is swallowed, and that not unfrequently mixed with arrack. We shall see afterwards that it is used medecinally.

On the Tinco, and Samshing, the owners of many Opium shops almost entirely depend for their livelihood. By the sale of these the rent is paid, the family are supported, and the servants kept. If a man sells 3 taels of chandu a day, he receives about 1½ taels of Tinco,

or more correctly $1\frac{3}{4}$), and from the consumption of that he gets about seven-tenths of a tael of Samshing; if the Chandu sells for $ 6 the 3 taels, by his Tinco and his Samshing he will realize nearly $ 3 a day, and this is his income; few however sell so much daily, and fewer still receive so much.

The Opium shops vary much in their appearance from an attap hovel to a brick house of two stories, paying $ 15 monthly for rent, but, generally speaking, the luxury of the pipe is all that the Opium smoker cares for, and anything adventitious, such as a commodious apartment, elegant furniture and proper ventilation are disregarded. In some houses there are various apartments in addition to the one which is entered from the street, for, according to the Police laws, 9 o'clock P. M. is the hour when all parties are supposed to give up their pipes. Vain expectation to suppose that any man who has money would relinquish the soul inspiring luxury until his ecstacy was at its full. Sooner would the panting traveller under a burning sun, when hours have elapsed ere his parched lips have been moistened, dash from his mouth the goblet before his thirst was half quenched, than the opium smoker be the slave of time. If 9 o'clock is come, and he has not reached his acme, he merely retires to an inner chamber, where, at his ease and undisturbed, he passes through his stages of enjoyment. Yet another apartment exists, generally up stairs, where females are to be found, more or less connected with the establishment, though sometimes strangers, who may not be allowed in their own houses to enjoy in quietness their taste for the pipe. This apartment is of course a closed one to the generality of visitors of Opium shops; but, being possessed of a little influence, I procured admittance into one. It was my first entrance into such places, and I was rather struck with the general appearance of things; the room was large, but not well lighted, matted, and chaired, and in the centre was a large bed. A table was near, on which were tea and sweet meats. Advancing a little, I saw a female sitting up in the bed, her back supported by cushions, and round her were two Chinamen and a Malay. The female was young and fair, yea passing fair, and richly dressed in the habiliments of the Flowery land. She little looked like a tempting fiend,

The Malay, a rich Pahang Trader, was reclining near her, smoking his Opium pipe, while the Chinese youths, respectable shop keepers were waiting her filling theirs. She herself was a devotee to the drug, and had been for three years, smoking at the rate of $ 6 a month, which is supplied her by the keeper of the Opium shop. Other vocations, she may combine with that of presiding over Opium orgies, for it is not at all unlikely, that, when the drug has taken effect, and the senses are more or less dulled, gambling may be commenced, the victims being at hand.

Destribution of Opium Shops. The number of Opium Shops, that is shops where the drug is consumed, and which although they may have no Pápán Mérá or sign-board, yet are well known from the mat and Chinese name, are far beyond what are allowed by Government, and, it is to be supposed, what are known by the Police. I have been a visitor in eighty Opium smoking Shops, within the limits of Singapore Town. The number supposed to be licensed is forty five. The number in the country I cannot tell; but wherever there are a dozen Chinese squatted, there you have an Opium Shop. On the road to Sigláp, between Captain Elliot's bridge over the Káláng and my bungalow, are six Shops, and on the same line of road there are not 15 more houses belonging to Chinese. As in England of old so here you have at the present day certain trades congregated together, not indiscriminately mixed. You have carpenters in one street, blacksmiths in another, gold and silversmiths in a third &c., &c. Now certain trades are greater consumers of opium than others. Amongst the principal are carpenters, box makers, blacksmiths, barbers, huxters, coolies, boatmen, and gambier planters including gardeners. These trades seem almost entirely to be devoted to the drug. I should say fully 85 per cent are opium smokers. Other trades as shoemakers, tailors, pork venders and bakers are not by a great percentage equal to the previous classes, for instance tailors and shoemakers have not more than 20 per cent addicted to the vice. Whenever you have the first mentioned classes in abundance there you have a superfluity of Opium Shops. Well street contains nothing else than Opium and Carpenter's Shops, there being in that small

street no less than 4 Opium Shops. In Circular Road there are no less than 12 frequented by blacksmiths, huxters, barbers and boatmen. In Canton Street, which has 8 houses, there are 2 Opium Shops, the great resort of boatmen and huxters. In Carpenter Street we have 6, in Church Street 6, in South Bridge Road 6, principally frequented by Gambier people and gardeners, this being one of the principal entrances from the country to the Merchant's godowns and in a street without a name; but near to the Sepoy lines, we have the sepoys themselves resorting to the 2 Opium Shops in it. In Kampong Java, we have many Chinese, but many Javanese also frequent the opium shops there. In Kámpong Bugís are two shops frequented by a few of that nation; but principally by Chinamen settled amongst them.

In Kámpong Báwían I know there is not a shop, and I know there are but one or two instances of that class, giving themselves up to the vice. Formerly we had coupled with an opium shop a gambling one; but now if such an arrangement does exist, it is so well concealed, that during all my visits I never witnessed a Poa table, and frequently on interrogating an opium smoker, he will say that since the public suppression of gambling, his fortune has changed, his livelihood has gone and he cannot afford to smoke (for he has not got the money) half the quantity of Chandu that he was wont. This may account in a measure for the diminished quantity of opium consumed this year when compared to last, although one most respectable Chinaman who was formerly the Opium Farmer, says, the consumption of opium is but little affected by Gambling, from Arrack or Samshu being the intoxicating medium used, a much better instrument for raising excitement and stimulating to excessive play than opium, whose effects as we have shewn, are much more sedative than exciting.

CHAPTER V.

THE PHYSICAL AND MENTAL EFFECTS RESULTING FROM THE HABITUAL USE OF OPIUM.

"WHAT is commenced in amusement frequently terminates in earnest." "Evil habits being easily acquired and as the facility of their acquisition so is the difficulty of their relinquishment." How exemplified do we find these remarks in the career of the opium smoker. Often have I asked him what could be the inducement to learn such a vice, and he said, amusement. Often have I abraided a youngster with his precocious depravity, and his excuse was that he was no slave to it; but only taking it for *méin méin*, that is amusement. Which amusement repeated now and again is at length continued daily, until the habit at last established can never be broken off unless with the life of the individual.

The causes which induce opium smoking are various, but the one now mentioned is the principal, although most opium smokers, especially Malays would fain refer the cause to bodily sickness, which compelled them to take to smoking, to alleviate pain, the remedy at last proving the greater evil of the two. One Malay gave compulsion, as his reason for smoking, as his master the Rajah of Siak an inverate smoker would allow no attendants near him who did not use the drug.Sometimes children are taught by their parents and wives by their husbands. In fact the same causes which are well known to induce spirit drinking at home, exert an analogus influence here in producing opium smoking.

The effects produced by the use of this drug are variously stated by different authors. Men of weight it science have insisted that while it makes life miserable it does not shorten it, and many believe this aphorism. Literary men of reputation have spread abroad by the elegance of their statements the dreams that attend the use of it, and many believe them. In itself the operation of the drug is pleasant, slow, and deceitful, and being easily concealed from public gaze offers a strong temptation to the lovers of secret excitement. The Merchant finds it a profitable article of trade and would persuade

himself that he is merely supplying an article of luxury, much less pernicious than ardent spirits, and finally the Government, seeing and feeling that the income to be derived from its use is great and convenient, have ears, but hear not of its evils, and they lay the flattering unction to their souls, that if they did not tax it the consumption would be greater and therefore the evil would be increased.

All these parties err from ignorance; charity compels me to think they know no better; but that such an excuse may not serve for the future, I will briefly transcribe from my notes, taken on the spot, the ipsedixit statements of persons who, themselves Opium smokers, can best express their feelings, and paint their miseries.

June 25th. Visited in company with the agent of the Opium farmer 4 Opium shops, found them filled with Chinese except one which had in addition 7 Malays and natives of India. Amongst these were 3 tailors; one woman 30 years old, was there smoking her pipe,—she had been in the habit of doing so for 3 years at the rate of 3 hoons daily,—before she commenced the habit of smoking had children but none since,—thinks that it is owing to the bad habit,—would like much to give up but is frightened. She states that no one who has smoked for a long period can have children, and her testimony was corroborated by all around, who were miserable diseased looking objects. One Malay learned the habit when off the Cape of Good Hope and while in Lodon bought the drug very cheap. One tailor receives $ 7 per mensem and spends $ 4 in Opium.

30th. Visited two shops. In the first were about 50 smoking. After examining these went up stairs and found it divided into sleeping apartments,—saw one female on a bed with two men. They were smoking from one pipe the one after the other, the female filling for them. Presently the party was joined by a second female. The first female had been a smoker for only 10 months, the second for 10 years, both complained of the bad effects of the habit,—the second female had 4 children, 3 were dead,—when young had abundance of milk, but had none for the two last children, from which cause they were sickly and died. In the morning when she awakes, she says, I feel as "one dead, I cannot do any thing until the pipe is consum-

"ed. My eyelids are glued so that they cannot be opened. My "nose discharges profusely, I feel a tightness in my chest with sense "of suffocation. My bones are sore, my head aches and is giddy "and I loathe the very sight of food." Such is her account of her daily misery. The other female occasionally indulges in arrack, and then she has no craving for opium. Both were constipated generally 5 to 6 days; with the one the venereal appetite was much diminished, with the other nearly destroyed.

In entering the second shop I was struck with the miserable skeleton like appearance of the owner, who sat behind his small counter doling out the drug. He had smoked for 30 years and his allowance was one chin or the one-tenth of a tael daily, about the value of $ 6 monthly. Of 12 men whom I examined, three had smoked for 10 years, one for 15, four for 6 years, one for 5, and the rest between 8 to 10 years, one Chinaman, who is a petty shopkeeper consumes $ 10 monthly of the drug. He states that in 100 Chinaman, 70 smoke, almost all the coolies do so more or less. If a cooly earns $ 5 monthly, $ 1 goes for food, 20 cents for house rent, a small outlay for a jacket and trowsers once in six months, and all the rest goes in opium. From his own experience and what he has seen of others, he would say if a man has been accustomed to smoke opium for 7 or 8years and gives it up for a day, he is attacked with a diarrhoea, frequently having from 20 to 30 evacuations daily, while during the time he is smoking he is constipated, frequently for 8 to 10 days, micturition is performed with difficulty and much tediousness, the venereal appetite is much impaired, nearly lost, what desire remains is wretchedness from the inability to consummate. Men long habituated to opium do not beget children nor women bear them. At first the venereal appetite is increased; hence many for that purpose are induced to become opium smokers; but speedily it is diminished. A great many women smoke, generally the wives of opium smokers. He who commences with 1 hoon daily will shortly require 2 to produce the same state of ecstacy necessary for his comfort." Further he states, that after his quantity is consumed he feels no desire for sleep till 12 or 2 in the morning, then he falls into disturbed slumbers

which last till 8 or 9 (now mark the description of this man's sufferings) when he awakens his head is giddy, confused and painful, his mouth is dry, he has great thirst, but cannot drink for vomiting, his eyelids are glued together, and his nose discharges foetid matter, his appetite is gone, and he can neither read nor write, that is transact his business, he suffers pain in all his bones and muscles, he gasps for breath, he wishes to bathe, but cannot stand the shock, and this state continues until he gets his morning pipe, when he can eat and drink a little, then bathes and attends to business. The force of example taught him this vile habit and he knows no classes of people exempt from it except Europeans. "Look," says he appealing to himself, "I was, ere I gave way to this accursed vice, stout, strong, and able for anything. I loved my wife and children, attended to my business and was happy; but now I am thin, meagre and wretched, I can receive enjoyment from nothing but the pipe, my passions are gone, and if I am railed at and abused like a dog, I return not an angry word."

In the whole of this assembly one man only was stout and healthy looking, at which I was surprised, for he had been a smoker for 5 years. Oh! said his companions, "he is a poor wretch who can only smoke his 2 hoons daily, wait till he gets richer and can smoke his ten and he will be thin enough."

31st. Visited one Opium Shop, saw 30 smoking, on examination found that each smoked on an average 8 hoons daily. Examined all individually, their unanimous testimony is that from 70 to 80 per cent of Chinamen are consumers of opium. One man mentioned a curious fact. He had been a smoker for 10 years, and if for a day he gave up smoking, his urine became white and turbid like milk.

In another shop upstairs was a female smoking with 3 men, her monthly consumption was at the rate of $ 10, has had four children, and is still stout and good looking, never lost her supply of milk, her appetite is good, and her passions still vigorous (this woman is an exception.)

July 9th. Visited several shops, examined 31 men, their average consumption was 6 hoons, the greatest daily consumption by one man was 15 hoons, the smallest 2, the average number of years they had

been addicted to the smoking of opium was 7 years and some odd months. The average individual amount of wages of these 31 men was four dollars and seventy seven cents, and the value of the opium consumed monthly by each man at the rate of 6 hoons daily was $3 60c. Upstairs I found one woman who had been an opium smoker for 3 years, at the average rate of 6 hoons daily, she stated that she had 2 children, but they were very sickly and always crying, and how did she stifle their cries? Oh women! if ye have a spark of motherly feeling in you, ye will join with me in execrating this vice, whose practices are so horrible, that if I could not vouch for it, credulity itself might turn a deaf ear to my cry, while humanity would thunder nay. I saw the woman pressing to her shrivelled, sapless, breasts, her weeping offspring whose thin and yellow face, and withered limbs showed what little sustenance was to be obtained there. Its shrill cries and convulsed limbs seemed now to excite the attention of the mother, who was all the time enjoying her pipe, when, to my horror and astonishment, she conveyed from her lips to that of the child's the fresh drawn opiate vapour, which the babe inspired. This was repeated twice, when it fell back a senseless mass into its mother's arms, and allowed her quietly to finish her unholy repast. This practice she had often recourse to as her child was very troublesome, adding that it was no uncommon thing for mothers to do so.

With this extract from my notes, I will finish, as much I have seen is not meet for the public eye, and will proceed to describe the physical evils resulting from the habitual use of Opium, premising, that it is from the examination of above 300 Opium smokers that the succeeding account is derived.

A state of excitement, or one of sedative tranquillity, is what is primarily desired by the Opium smoker, and which at first is effected by a small quantity of the drug. That small quantity soon loses its effect, and to produce the same amount of excitement the dose must be doubled, and that again increased until I have known the original quantity multiplied one hundred fold.

The first evils resulting from the habitual use of Opium seem to be connected with the nervous system; disturbed sleep, wakefullness,

giddiness on raising the head, and sometimes head ache, are the first symptoms. The nervous power from being increased is soon disturbed, and the functions of the body become unsettled, at one time of a more than ordinary power, at another much below par, the appetite becomes capricious; sometimes we have costiveness, sometimes the contrary. Strange feelings are experienced about the chest, the eye may sparkle a little at night, but early in the morning it is hazy, the tongue becomes covered with a whitish fur, the pulse is but little affected and the urinary organs are not yet disturbed: But continue the vice, and we have the nervous system still further giving way. The sensations in the head are now increased, the giddiness is troublesome and the headache annoying, the eyes now discharge a copious mucus secretion, and so does the nose, without doubt from relaxation of the vessels owing to impaired nervous energy. The stomach soon shares. Digestion becomes impaired, at first uncertain, at last it is destroyed. We know from experiment the power the nerves have over that function, so that if the Pnumo Gastrics in a dog be tied, digestion is completely stopped and the gastric juice not evolved. In the opium smoker the nervous energy is impaired, the gastric juice is lessened in quantity, perhaps depraved in quality, and the muscular coat of the stomach, no longer receiving its usual supply of nervous power, fails to perform its churning-like office. From these causes the food is only partially digested when it passes into the intestines. Some of it in its crude state is absorbed into the system, the remainder waits until it is dejected, this, in the commencement of the smokers career, and while he daily uses the drug, does not take place oftener than once in 5 or 6 days, nay, even it is extended from 10 to 15. The urinary organs now become disturbed, micturition is not so easily performed, a discharge takes place, which some think seminal, but I should say rather mucus, and proceeds from the visiculæ seminales. The generative organs, which formerly were highly excitable, have now, in a great measure, lost their aphrodisiac power and few and far between are their capabilities of indulgence. It is at this stage that we have amongst the opulent the various aphrosidiac remedies used, as tigers's foot jelly, eggs of the black fowl, and

hot spices. The outward appearance of the man changes. The firm fat is replaced by an oily secretion, which, in its turn becomes absorbed, the muscles lose their torosity, becoming loose and flabby, disinclination to work hastens their decay, and a dull gnawing pain for hours in the morning becomes a daily occurance.

The upright manly figure begins to stoop, and a shuffle in the gait is soon noticed, a well marked index of an opium smoker. But it is in the eye that he who runs may read the effect of the vice, for its lustre has gone and its brilliancy disappeared. It seems to have sunk into its socket, while the eyebrows have become more drooping, its color from a pure white is now a dingy yellow, and the blackness of the lower eyelid tells how deranged the general system is. Notwithstanding all these symptoms, there seems as yet no structural derangement, no inflammation of any part, but as the opium smoker still madly hastens on in his carreer, his rest becomes disturbed, he sleeps by snatches, he wakens unrefreshed, his appetite has nearly left him, what food he takes he rejects, and all fluids are vomited until he indulges in his pipe, then these symptoms are a little alleviated. His digestion is now thoroughly disturbed, in fact destroyed, he complains of incessant pain in the stomach, only to be allayed by the drug. Diarrhoea more or less is present, a gradual wasting of the body follows which is thus pithily described by Mr. Koo King Shan a literary gentleman of Keang Ling—"from the robust who smoke, flesh "is gradually consumed and worn away, and their skin hangs down "like bags. The faces of the weak who smoke are cadaverous and "black, and their bones naked as billets of wood." Diarrhoea ending in dysentery frequently follows, while the alvine secretions are in a most disordered state. The difficulty in micturition, along with other causes, lays the foun dation for renal disease, the kidney soon presenting Brights degeneration one of the exciting causes of dropsy which attacks so many opium smokers; vesical disease is also induced and a deranged turbid, and mucus state of the urine is found in almost every smoker. Sometimes the chest is the part most affected, and while for years the victim has complained of tightness there, he now complains of difficulty of breathing, gradually increasing to a

sense of suffocation. Oedema of the lungs or effusion into the pleura have now set in. Sometimes complaints are made of pain in the cardiac region, and weak and irregular are found to be the rythms of the heart, until after repeated warnings it at length forgets its part, and there is left but a senseless mass of clay, the remains of the miserable opium smoker.

The low state of nervous energy predisposes to large boils and carbuncles, from the latter of which few recover. I remember one very wealthy Chinaman, whom I attended for carbuncle; but who perished in spite of every care, and it was not until his death I learned that he was an inveterate opium smoker. This low state of vitality gives rise to many filthy foul and indolent ulcers, which attack two thirds of the paupers under the care of Dr. Traill. Scrofula, and tubercles are also induced. In fact every disease that has its origin in a weakened action of the vital power is produced on the person of the opium smoker by this habit, and when disease of a violent nature does attack him he immediately succumbs. I have seen a remittent fever run its course with a Chinaman in four days, and where this fever prevails, as at Blákán Mátí, and Tánjong Págár, the Chinese are the principal sufferers.

I have avoided entering into professional details, as this paper is more or less intended for the general reader. I will therefore finish this account of the physical evils resulting from the habitual use of opium by giving the opinions of Doctors Oxley and Traill, the H. E. I. Coy's Surgeons for this Settlement.

Copy of a letter from THOMAS OXLEY, *Esq, H. E. I. Coy's Res, Surgeon, Singapore.*

" My Dear Little,

1st. Does the use of opium induce physical evils and what are they?

" Here is my opinion in answer to your que-
" ries.

" The inordinate use or rather abuse of the
" drug most decidedly does bring on early de-
" crepitude, loss of appetite, destruction of the power of procreation
" and a morbid state of all the secretions; but I have seen a man who

" had used the drug for 50 years in moderation without any evil ef-
" fects, and one man I recollect in Malacca who had so used it was
" upwards of 80, several in the habit of smoking assured me that in
" moderation it neither impaired the functions nor shortened life, at
" the same time they fully admitted the deleterious effects of too
" much.

2d. What physical evils result to opium smokers on being deprived of the drug?

" I have seen death follow, and I recollect
" a Malay who was apprehended on some cri-
" minal charge some years ago, who when first
" locked up previous to examination, and as a
" matter of course deprived of the drug for some days, pined away
" so rapidly that although only 4 or 5 days in the lock-up-house, he
" could not leave it when released, but was carried out, having en-
" tered the place as strong and muscular a man as could be met with.
" The lower class of Chinese when deprived of their allowance are
" very liable to become dropsical, and I have lately quite cured se-
" veral cases of this sort by allowing a moderate quantity of the drug
" for smoking. I have tried the opium in substance, but with not
" nearly so good an effect, I find the Sesquicarbonate of Ammonia, Tr.
" Valerian Vol., Tr. Opii, and mist. Camph. to be an excellent for-
" mula of medicine for these cases. The effect of deprivation, at
" first appears to produce desperation, a heart rending despondency,
" something like the low state of delirium tremens but differing in
" many respects from that malady. The 3d. query is pretty well re-
" plied to in this; death does certainly occur from deprivation and
" most generally I would say by effusion into the cavities and gene-
" ral dropsy."

" Yours truly,

" August 28th, 1847. (Sigd) THOMAS OXLEY."

Copy of a letter from WM. TRAILL, *Esq. M. D., H. E. I. Coy's Asst. Resdt. Surgeon, Singapore.*

" My Dear Little,

" I have been pretty busy this morning or would have
" answered you sooner.

" I have not paid marked attention to the effect of opium smok-

" in the Chinese Pauper shed have been formerly addicted to the " ing on the Chinese, but by enquiring I find that most of the men " practice, and to their present deprivation of it I am inclined to at- " tribute the very slight effect of the usual remedial agents on such " cases.

" Economy is a main object in that Hospital so that I have not " introduced opium smoking except in a few aggravated cases; but " I have seen enough to convince me that where the vice has been " before habitual, the moderate and judicious exhibition of opium " smoking will sometime effect a rapid cure when other remedies " have seemed inert.

" In answer to your first query, I may say that I have observed " that when a habitual opium smoker has been deprived of the ac- " customed stimulus, he becomes liable to various diseases, princi- " pally Dropsy (more especially " Anasarca",) " Atrophia" and " Bowel comp'aints, also troublesome Dyspeptic Symptoms and any " previously existing disease is commonly much aggravated. To " your second query I may say I have seen death result in the above " mentioned diseases, when opium has been withheld; on the other " hand I have seen recoveries that could only be attributed to opium " being allowed.

" In answer to your third query, my limited experience does not " warrant me in saying, that opium smoking is in any way so power- " ful a promoter of disease as the habitual use of alcoholic liquors."

" Yours in haste,

" 28th. August, 1847. (Sigd.) Wm. Traill."

CHAPTER VI.

THE POWER OF THE OPIUM SMOKER TO MODERATE THE QUANTITY OF OPIUM USED.

Does such a power exist? for on that, will greatly hinge the question as to the deadly injury to which the use of opium subjects mankind who indulge in it, and its greater or lesser power in creating disease, when compared with intoxicating spirits.

Can a man inhale a mouthful or two of the smoke, and before his

quantity of Chandu is expended, cry hold enough? My friend Dr. Oxley would hint that some had that power. I have never seen it, and I have searched every where for one, who with money, stopped short of partial insensibility.

I have examined hundreds, and the only limit to their indulgence is their means. All, to a man, have so expressed themselves.

Often have I asked an opium smoker how much he daily used? "five hoons" or the one-twentieth of a tael. How much could you smoke? "as much as I could get, when I have money I smoke two or three chin daily, if I had sufficient, I could smoke one tael daily." A superior officer in a memorial to the Emperor of China as quoted by Sir John Davis, says, "I have learned that those who smoke opium, and eventually become its victims, have a periodical longing for it, which can only be answered by the application of the drug at the regular time. If they cannot obtain it when the daily period arrives their limbs become debilitated, a discharge of rheum takes place from the eyes and nose and they are altogether unequal to any exertion; but with a few whiffs their spirits and strength are restored in a surprising manner, thus opium becomes to opium smokers their very life."

The writer of an essay on the opium trade, says, "there is no slavery on earth to name with the bondage into which opium casts its victims, there is scarcely one known instance of escape from its toils when once they have fairly enveloped a man."

Not confined to the Chinese alone is this fascination of the drug, for Mr. Bruce, superintendent of Tea culture in Assam, in allusion to the opium smoker, says, "He will steal, sell his property, his children, the mother of his children, and finally even commit murder for it."

Even Mr. Marsden who is quoted, as will be seen hereafter, as an authority that opium is not prejudicial, says, "the use of opium amongst the people of Sumatra is a species of luxury that all ranks adopt, according to their ability, and which when once become habitual, it is almost impossible to shake off."

Sir Stamford Raffles gives it as his opinion "that the use of opium

is so much more dangerous because a person who is once addicted to it, can never leave it off."

A Chinese author, Koo King Shan, says, "it destroys life, the poor smoker who has pawned every article in his possession still remains idle and inactive, and when he has no means of borrowing money, and the periodical thirst returns hard upon him, he will pawn his wives, and sell his daughters. Such are the inevitable consequences! In the province of Nyankway I once saw a man named Chin, who being childless purchased a concubine, afterwards when his money was expended, and all other means failed him, being unable to resist the desire for the pipe, he sold this same concubine and received for her several tens of dollars, this money being expended he went and hung himself."

Even the classical De Quincy confirms the mastery of the fascination in his "Suspiria de profundis", being a sequal to his Confessions, "at the close of this little work the reader was instructed to believe, and truly instructed, that I had mastered the tyranny of opium. The fact is that twice I mastered it, and by efforts more prodigious in the second of these cases than in the first. Twice I sunk, twice I rose again, a third time I sunk, partly from the cause mentioned, partly from other causes. During this third prostration before the dark idol, and after some years, new and monstrous phenomena began to arise." Now reader mark how akin these mental evils are to the physical ones, and believe in their truth, for they are registered by a victim who would fain in the beautiful shadowing of his imagery dull the perception of his readers. "For a time these phenomena" he says, "were neglected as accidents, or palliated by some remedies I knew of. But when I could no longer conceal from myself that these dreadful symptoms were moving forward for ever, by a pace steadily, solemnly, and equally increasing, I endeavoured with some feeling of panic for a third time to retrace my steps. But I had not reversed my motions for many weeks, before I became profoundly aware that this was impossible: or in the imagery of my dreams, which translated every thing into their own language, I saw through vast avenues of gloom, those towering gates of Ingress, which hitherto had

always seemed to stand open, now at last barred against my retreat, and hung with funeral crape."

I cannot but think that after these extracts, the reader will entertain not a doubt, that once the use of Opium is commenced it cannot be broken off willingly, by the individual.

I will now proceed to the next part of the chapter, which is a comparative view of the evils induced by drunkenness, or the abuse of intoxicating fluids, and the habitual use of Opium.

To place clearly before the reader's eye, the arguments in favour of the use of Opium. I cannot do better than give the verbatim, but suppositious dialogue, betwixt De Quincy the English Opium eater and Mc. Nish the author of the Anatomy of Drunkenness.

Opium Eater. I believe Doctor that the use of Opium is frequent among the working classes in manufacturing towns.

Modern Pythagorean. It is Sir.

Opium Eater. Do you approve of it?

Modern Pythagorean. I should wish to speak with diffidence, with deference in the presence of a man of distinguished genius who is himself a living and illustrious proof that Opium even taken in quantities, that before the publication of the confessions would have seemed to physicians in the country at least incredible, of the effects from the distillation of the poppy. Yet that these effects are always pernicious and often fatal when the use of Opium has been carried to any excess, is, I speak humbly, in my opinion the general rule, not weakened perhaps by one splendid exception. There are in the human constitution such extraordinary idiosyncracies that no physician will be so rash as to expect that some there may not be, and one such allow me to say must be yours, with which Opium takes kindly, and acts so as to induce over the mind, not weakness and obfuscation, but strength and brightness of all the intellectual powers. I should assuredly think so, reasoning either a priori, if indeed such reasoning can be applied pure in medical science, or from induction.

Opium Eater. Allow me to say Sir, that the opinion you now express is entirely that which I should have expected from the Author of the Anatomy, one of the most ingenious and philosophical treatises which has in our days been contributed to medical science.

Modern Pythagorean. A mere trifle in my estimation I assure you Sir, nothing but an humble thesis.

Opium Eater. Will you be so good as to inform me from your own experience, whether you think Opium or spiritous liquors taken for the same purpose, we shall suppose at present intoxication, be the more hurtful.

Modern Pathagorean. Let me confine myself, Sir, first to the moral question. Spiritous liqours irritate the blood and the brain and excite wrath, rage, fury, and the most mortal quarrels, thence many, most, of the violent crimes that bring miserable men to the Gallows, but Sir, no instance has come within my knowledge of an Opium Eater, at least in Great Britain or Ireland.

Hogg. A capital argument, and quite unanswerable.

Modern Pythagorean. Again Opium whether in pill or drop, is I believe in this country, almost always taken in secret, or in parties of two or three, at least I never knew or heard of any member of an opium club. Drunkards congregate together and thence by sympathy intenser corruptions, then disease and delinquency are brewed together, and what have you but a poisonous scum?

Opium Eater. Sir, you speak well and truly, and therefore I ask, would not in your opinion, opium be a safer substitute to the poor for spiritous liquors?

Modern Pythagorean. From the premises I have laid down I leave a Gentleman of your logical powers, for yourself to draw the conclusion. But I have no hesitation in saying, that by the use of opium such as it is to my knowledge, and I confine myself to that in this country, less evil, far less, nay comparatively little, is done to the morals of those amongst the lower classes who are addicted to that

drug than among the lower classes by spiritous liqours to drunkards. This is to be kept in mind that the number of those who take opium to excess is comparatively small indeed, nay among the poor I never knew of one such case, whereas drunkenness, fatally is a national vice, with us almost at once an epedemical disease, a contagion and an infection.

Opium Eater. But my dear Sir, may it not be that the moderate use of opium among the working classes in manufacturing towns, and you seem to believe that there it is rarely immoderate, is in a moral view preferable to the use of spiritous liquors which you rightly say is there so prevalently immoderate as to deserve the names you have so eloquently inflicted upon it, and the fearful character you have drawn on its effects in your admirable little book?

Modern Pythagorean. This I will say Sir, that any means of making the wretched forget or endure their miseries, used in the shape of any other drug, must be better, and that none can be so bad as spiritous liqours, used to such an extent as to make men and women habitual drunkards. And this I say freely without at all compromising my opinion, that among the poor the use of opium is an unmixed evil.

Opium Eater. Pardon me Sir, but in many cases when taken medicinally it may not be an evil at all, for mark my word medicinally, and who can say when 18 hours toil out of four and twenty have bowed down, both soul and body to the dust, a few drops of laudanum, may not be in the best term, a blessing. It may not be what physicians, what even *you* Sir, in your enlighted humanity would prescribe, but still in the destitution of other and better medicine, in the destitution of sustaining and restoring food, it may act as a charm and not as a baneful charm, on those whose heartstrings are as weary as their backs, loins, and reins, and who are thus lulled into endurance or oblivion."

The preceding will give an idea to the general reader, in what opinion the use of opium is held at home, and this opinion has had

so much weight as to give rise to the remarkable saying that "the use of opium does not shorten man's life, but only while there is life makes it miserable." In reviewing the Modern Pythagorean's statement, you will see he contrasts the drunkard, or he who indulges to excess in spiritous liquors, and the Opium Eater, (for they do not smoke it at home,) and gives his verdict in favour of the latter, at the same time he allows that he never saw a case amongst the poor, where the drug had been taken to excess. This reasoning is certainly "a priori" and not by induction, yet in some respects he is right, for there is no doubt, nay it is proved by every day experience that the drunkard is ready for any crime while in the state of inebriety; a striking proof of which is given by Monsieur Quotelet in his work on man, in which he mentions, that in nine hundred and three murders, committed from hatred, revenge, and other motives, four hundred and forty six had been committed during quarrels and contentions at taverns.

The abuse of alcoholic liquor and opium both affect the life, and comfort of man, the former directly, the latter indirectly, the one more directly induces organic and structural changes, the other primarily induces functional, which subsequently leads to structural derangement, the one may be said to murder its victim the other to starve him. The drunkard in one bout may commit suicide, the opium smoker cannot, he can only attain insensibility. The drunkard during his intoxication commits his crimes, which when sober he loathes. The opium smoker during his ecstacy is at peace with all mankind, but when unable to obtain the drug, and the fit is on him, he will do all that does become a man, yea more, he will steal, and attempt even murder. The drunkard can give up his vice for strong inducements, the opium smoker has done so in so few instances as to entitle us to say the habit cannot be broken off. Many drink but do not abuse it, many smoke opium, but all abuse it. Drunkenness has its limits and fashion; opium smoking is without a limit and acknowledges no fashion, once it is introduced it is omnipotent in its power, and universal in its application.

A table to enable the reader to contrast at a glance the evils resulting from the abuse of ardent spirits, and Opium smoking.

The abuse of ardent Spirits.		*The abuse of opium smoking*
The habit is quick and progressive to a certain amount, then stationary, *sometimes abandoned.*		The habit is slow, steady, and progressive in its fascination, seldom or never abandoned.
Excitement followed by depression. Capricious appetite, vomiting, pain of stomach, headache, irritability of nerves, partial loss of sensation in feet, tingling in the fingers. Diarrhoea, dysentery, derangement of liver, bilious vomiting. Restlessness, want of sleep, dreams, unequal spirits, increase of passions, faltering gait, bloodshot eye, hot, dry skin, perspiration.	gives rise to	Slight excitement followed by narcotic tranquility, restlessness want of sleep, frightful dreams, loss of passions, depression of spirits, shuffling gait, sunken listless eye, yellow dry skin, perspiration. Loss of appetite, vomiting, pain of stomach tympanitic and other dyspeptic symptoms, pains in muscles and bones, difficulty of breathing and micturition, discharge of mucus from eyes, nose, anus and penis.
Complete Dyspepsia, inflammation of stomach, diarrhoea, frequently dysentery, loathing of food, irritable and phagedenic ulcers. Carbuncles, effusion in pleura and pericardium. Brights disease of kidneys, nutmeg liver, dropsy of abdomen, & general oedema, inflammation of membranes of brain, dilirium tremens, apoplexy, paralysis, mania, spontaneous combustion.	ends in	Complete dyspepsia, diarrhoea, somtimes dysentery, want of appetite, general atony, slow and indolent ulcers, carbuncles and cutaneous diseases, effusion in the pleura and pericardium œdema of lungs, dilatation and weakened power of heart, chronic inflammationof bladder, Brights disease of kidneys dropsy of abdomen and ventricles of brain, general œdema, general wasting of body, imbeciility of mind.
DEATH.		DEATH.

CHAPTER VII.

THE MORAL EFFECTS OF OPIUM SMOKING.

We have now examined the physicial evils that result from the use of Opium, and have contrasted it with the like use of ardent spirits. In this chapter we will endeavour to shew its moral effects as one of the causes of crime and poverty.

In the physical state we have two causes for the production of disease, first the predisposing cause, or an aptitude to receive the impression of the second, or direct exciting cause. Two men may, for instance, be exposed at the same time to malaria while sleeping in the jungle, but one only may be attacked with fever,—the direct cause or the Malaria was present to both but the predisposing cause existed in the one attacked and not in the other, and that predisposing cause might proceed from fear, anxiety, derangement of the bowels &c. Now with the moral man two conditions require to be present, before moral disease or crime can be committed, the first condition is the natural inherent depravity of man received from our first parents, one of whom once was "oh fairest of creation, last and best of all Gods works, creature in whom excelled whatever can to sight or thought be formed, holy, divine, good, amiable, or sweet," until she came to violate the sacred fruit forbidden, when "on a sudden lost, defaced, deflowered, and now to death devote" She has cursed all succeeding generations with this predisposing aptitude to sin, which makes it as natural for a man to sin as to live. Certain moral feelings raised by the voice of conscience, and a perception of right and wrong received from education, religion and example, with a sense of shame and fear of detection, are the preventive checks to this universal developement of the inherent depravity of man, but these checks may give way before the second or the direct exciting causes, which are want, the gratification of the passions and habits; according to the number and the force of the preventive checks will you have more or less crime, and the same applies to the second class or direct exciting causes. In the physical state all are not afflicted at all times, with

the predisposing causes of disease, except that which leads gradually to the consummation of all life, which is death, but in the moral state no one is exempt; hence the physical man can pass thro' life without disease sen-ibly breaking out, until exhausted nature, like the rim of an old wheel, by constant use is worn out, but the moral man has not the same chance, for having always with him the predisposition to sin, he cannot live and not meet with exciting causes. In the civilized world, and I would confine myself to England, the preventive checks are many and numerous, but the second or direct causes include one that in itself is "legion," that is want. In Singapore the preventive checks are fewer in number and less powerful, but with a slight exception, the second or direct causes of crime do not include that one, which is, according to the annals and statistics of crime, the direct cause in nearly one half of the cases, I mean want. Our prisoners here have not in such force the preventive checks of education, religion, and example, hence their inherent, or predisposing aptitude to sin is in greater force than it is in England, but their exciting causes do not number amongst them, that want or starvation, which drives multitudes to sin and crime, the consideration of which ought, like the recording Angel's tear, to blot out much of the criminality of the transgression, but here no one except a helpless infant, or bed ridden adult can starve, therefore the gratification of the passions, and the indulgence of evil habits, are, I may say, the only two direct exciting causes of crime. Amongst the evil habits, which require the commission of crime to keep it up, is one, that of Opium smoking, and which is so universal and so powerful as to have none other like it.

Let the reader examine this table, it is taken by myself from the prisoners sentenced by the police to the house of correction. July 1847.

Table No. 1.

Class.	Quantity of Opium used daily.	No. of years habituated to O. S.	Trade.	Monthly Wages.	Value of Opium smoked monthly.	Appearances.
1 Chinaman.	10 hoons.	10	Cooly.	4 drs.	6 drs.	Heavy, listless, but not sickly.
2 do.		Does not	smoke.			Looks well and fat.
3 do.		do.				Looks well but not stout.
4 do.		do.				Looks well. [drinking tinco in arrack.
5 do.	30 „	10	G. Planter.		18 „	Looks well has given up smoking since his entrance by
6 do.	15 „	12			7½ „	45 yrs. old, looks much older, grey hair, sickly, diarro-
7 do.	10 „	20	Cooly.	12 drs.	6 „	49 yrs. sickly, thin and miserably looking. [hea cough.
8 do.	30 „	7	G. Planter.	3 „	18 „	Sick and herpetic.
9 do.	15 „	6		5 „	7½ „	Sickly looking and complains.
10 do.	10 „	20	Cooly.	4 „	6 „	Thin, sickly, complains of pain in stomach.
11 do.	8 „	4	do.	4 „	4 one-tenths „	Yellow, sickly, pain in abdomen.
12 do.	50 to 60 „	16	G. Planter.		30 to 36 drs.	Thin, sickly, complains of cough.
13 do.	5 hoons.	10	Cooly.	4 „	3 drs.	Complains of pain in abdomen.
14 do.	15 „	6		4 „	7½ „	Thin, but not sickly.
15 do.	10 „	16	do.	4 „	6 „	Thin, cough and sickly.
16 do.		Does not	smoke.			
17 do.	4 „	9	Cooly.	4 „	2 drs. 40 cts.	Complains of pain in abdomen but does not look sickly.
18 do.	10 to 30 „	30		5 „	6 to 18 drs	49 years old and sickly looking but does not complain.
19 do.	6 hoons.	5		8 to 6 „	3 drs.	Ring worm, diarrhoea and complains.
20 do.	5 2	5		4 „	2 „	Complains but does not look sickly.
21 do.	10 „	12		4 „	6 „	Complains but does not look sickly.
22 do.	8 „	5	Cooly.	3 „	4 drs. 80 cts.	Looks sickly, and complains.
23 do.		Does not	smoke.			Looks sickly.
24 do.		do.				Looks well.
25 do.		do.				Looks well.
26 do.	10 „	15		4 „	6 drs.	Complains much, being without chandu.
27 do.		Does not	smoke.			Looks well.
28 do.	6 „	6		3 „	3 drs. 60 cts.	Pale, sickly looking, complains much.
29 do.	8 „	5	Shop keeper.		4 „ 80 „	Thin and sickly.

15 men in Hospital, of whom all smoke but one.

The examination of this table ought to convince the most sceptical of the dreadful effects of the habitual use of Opium, morally, and physically. Here we have in this house of correction 44 Chinese of whom 35 are Opium smokers, not in a moderate degree, but to excess, not confining themselves to what they can spare from their wages, but actually in some cases swallowing them all up and much more. Of 17 men the aggregate amount of their wages monthly is £ 77, or individually £ 4. 53, their monthly consumption of opium amounts to £ 99. 90, or individually £ 5. 87: So each of these men in addition to spending all his wages, begs, borrows, or steals £ 1. 04, monthly; when I asked one man who spent £ 6 monthly and whose wages only amounted to £ 3 how was this? was he not deceiving me? how was it possible that he could do such a thing? his answer was graphic and much to the point: "What am I in here for?" I am sorry I cannot give a correct list of the offences these individuals were confined for, not, but I have tried to do so, but those who could furnish me with the data would not do so, or referred me to another, whose duty was more particularly to do that, and he to another and so on, but I may say from good authority that these persons would in a calender of crime be ranked under the head of Vagrants, suspicious characters, persons attempting to steal, and such like, their offences being against property, and not persons.

During the course of these investigations, I found some Opium smokers, who declared that their wages, only equaled the value of the Opium consumed, and in the majority of cases, but little exceeded their consumption, yea even I found instances, and these not few, where the value of the Opium consumed monthly, was more than the whole wages received. The idea then suggested itself to me that there must be an affinity betwixt Opium smoking and crime, for, having seen that once the habit is formed, it cannot be broken off, while the desire increases with the consumption, it must happen that the wages of the individual will at last be inadequate to supply his desire, even supposing that after a lengthened career of indulgence he was able to earn the same amount of money, as when, strong, vigorous, and unimpaired, he commenced his dissipation. I therefore

was not at all surprised, when I went to the house of correction, to find that threefourths of the prisoners were Opium smokers: this I say did not surprise me, but confirmed what I had already supposed. Determined to pursue the enquiry further, I examined the prisoners sentenced at the Quarter Sessions, and the grand Sessions of Oyer and Terminer as well as those who were in Jail, waiting their trial and undergoing their punishment. In table No. 2 taken in the beginning of July are fifty one Chinese prisoners, who were confined in the Jail; of these, the majority were waiting for their trial, a few only having been sentenced at a previous session: of these 51, 15 only declared they were *not* Opium smokers. Towards the end of September I again examined the prisoners confined in the Jail, the majority of whom I had examined in July, but some had not been examined having entered subsequently, and some had been discharged, the Court sitting at the time; from this examination, a very different result was obtained compared with the previous one, for out of 69 as seen in table 3, 31 only were found to be habitual Opium smokers. This naturally excited my astonishment. I then examined the prisoners sentenced to punishment at the Quarter Sessions, and found as Table 4 shows, that only 9 out of 23 were adicted to the vice, which confirmed the greater accuracy of Table No. 3, or rather its more general accordance with that class of criminals. Table No. 5 contains a list of persons sentenced to Bombay from Pinang of whom 10 are Chinamen, and one only of that 10 does not smoke; No. 6 the last table, shows a list of all prisoners condemned to the house of Correction by the Hon'ble the Recorder in this last Session; and in it we see 25 Chinese, 12 of whom are Opium smokers.

Table No. 2 of Persons incarcerated in Jail on the 2nd. July, including criminals who had been condemned and those who were yet to be tried.

	Quantity of opium daily consumed.	number of years habituated to opium smoking		Quantity of Opium daily consumed.	No. of years habituated to O. S.
1	30 hoons	6	26	3 hoons	2
2	10 ,,	7	27	4 ,,	½
3	7 ,,	7	28	10 ,,	10
4	5 ,,	10	29	15 ,,	16
5	4 ,,	2	30	4 ,,	3
6	4 ,,	1	31	boy 15 yrs.	does not sm'k.
7	3 ,,	½	32	2 hoons	10
8	4 ,,	10	33	5 ,,	6
9	7 ,,	5	34	8 ,,	15
10	5 ,,	2	35	3 ,,	2
11	10 ,,	20	36	10 ,,	12
12	3 ,,	6	37	4 ,,	2
13	2 ,,	2	38	10 ,,	10
14	5 ,,	11	39	does not smoke or drink	
15	10 ,,	5	40	5 hoons	15
16	3 ,,	13	41	3 ,,	2
17	3 ,,	7	42	4 ,,	4
18	6 ,,	3	43	8 ,,	14
19	10 ,,	10	44	7 ,,	10
20	5 ,,	5	45	does not smoke	
21	Does not smoke but drinks 10 cups of arrack daily.		46	10 hoons	3
			47	2 ,,	2
22	10 hoons	10 years	48	3 ,,	3
23	3 ,,	Tye tinco eats it	49	2 ,,	6
24	Does not	smoke	50	5 ,,	10
25	3 hoons	4 years	51	5 ,,	12

Table No. 3. Examination of Persons confined in Jail in the month of Sept., including those who were to be tried and those who had been tried.

No.	Quantity of opium used daily.	No. of years opium smokers.	Wages Monthly.	Trade.	Physical appearance.
1	5 hoons	6	5 drs.	Cooly.	Sickly, had been wounded
2	3 „	9	3 „	W. cutter	do. looking.
3	5 „	4			Thin, and sickly.
4	2 „	2	6 „	ditto	Does not complain [sickly
5	6 „	7	15 „	Planter	Comps. but does not look
6	4 „	6	8 „	Huckster.	do. of pain of bowels
7	5 „	1	10 „	Boatman	Lks. well, comp. of bowels
8	5 „	5	5 „	Gardener	Does not comp., lks. well.
9	4 „	4	5 „	Cooly.	Strong looking
10	4 „	4	10 „		ditto
11	4 „	4	4 „	Gardener	Sickly. [cough
12	50 to 60 hs.	16		G planter	Thin, sickly, complains of
13	5 hoons	10	4 „	Cooly [er	Com. of pain of abdomen
14	10 „	6	5 „	O.s'keep-	Thin sickly
15	3 „	3	4 „	Cooly	ditto [plains
16	4 „	5	7 „	S. wright	Strong looking but com-
17	3 „	12	7 „	Huckster	Old & frail, 63 years
18	1 „	1	4 „	Cooly	Thin, but not sickly
19	2 „	6	3½ „	do.	Lks well has given it upfor
20	4 „	3	4 „	do.	Thin but not s'kly [12 m.
21	4 „	5	4 „	Boatman	Leprous, stout
22	5 „	10	10 „	Tailor	Thin and rheumatic
23	10 „	20	15 „	Fisher	48 years, sickly
24	10 „	15	8 „	Gardener	Compl, & is s'kly looking
25	10 „	15	6 „	Fisher	Complains
26	2 „	2	9 „	Cook	Does not complain
27	6 „	15	8 „	Tailor	ditto
28	6 „	10	4 „	Cooly	Complains much
29	4 „	5	5 „	do.	Sickly
30	10 „	12	3 „	do.	Compls. but looks stout
31	5 „	20	8 „	Gardener	do. & looks flabby

The remaining Chinese to the number of 31 said they did not smoke.

Table No. 4. Criminals sentenced at the Quarter Sessions and at present incarcerated in the house of correction, July 1847.

Class of Prisoners. Chinamen	No. of years addicted to Opium smoking.	Quantity of opium smoked daily. hoons 10.—1 chin chin 10.—1 tael		Occupation.	Wages monthly.	Value of opium smoked monthly.	Remarks appearance &c.
1	20	2	hoons	Cooly	drs. 2½	drs. 1. 20	age 40, does not complain
2	6	2	,,	Mason	,, 3	,, 1. 20	,, 44, sickly much do.
3	3	1½	,,	Tailor	,, 10	,, 90	Sickly and pale
4	1	4	,,	Baker	,, 5	,, 2. 40	Does not complain
5	6	8	,,	Boatman	,, 5	,, 4. 80	Thin and sickly
6	20	3	,,	Huckster	,, 8	,, 1. 80	In the Hospital.
7	2	3	,,	G. cooly	,, 3	,, 1. 80	ditto
8	2	2	,,			,, 1. 10	ditto
9	1	3	,,	Gardener	,, 8	,, 1. 80	ditto

10 to 23 do not smoke, or at least they will not acknowledge to it.

Table No. 5. Criminals from Pinang who have been sentenced and are on their way to Bombay.

1	Malay.	Muda	smoke 5 hoons	Stabbing with intent to murder.
2	do.	Injang	do. [daily	
3	do.	Hamed	smoke 3 hoons	
3	Kling	Onary Kichil	does not smoke	Larceny.
5	Malay.	Voll	do.	
6	do.	Pangl. Oudert	do.	Murder at sea.
7	Chinese	Chan Chit	do.	Stabbing with intent to do some
8	do.	See Tun Ling		[grievous bodily harm
9	do.	Ong Hech		
10	do.	Chin Ayer	all smoke	Larceny.
11	do.	Ty Annam		
12	do.	Hai Hoo		
13	do.	Tuan Pier		[grievous bodily harm
14	do.	Ong Kay Tap	smokes	Stabbing with intent to do some
15	dn.	Tay Tye	both do.	Burglary and Larceny.
16	do.	Gee Hong		
17	Malay.	Quili	does not smoke	Stabbing to prevent lawful ap-
18	Kling	Hassan Tuan	do.	Larceny. [prehension
19	do.	Tanam Nodly	do.	Receiving stolen goods.
20	Malay.	Maat	smoked	Murder. Died in prison.
21	Kling	Silly Mahomet	did not smoke	Murder.

Table No. 6. Persons at present in the House of Correction and sentenced there by the last Sessions of Oyer and Terminer.

	Name.	Class.	Age.	Quantity of Opium used daily.	No. of years O. S.	Trade.	Wages.	Monthly value of Opium.	Crime.	Physical Appearance.
1	Latchmana.	..	28	Does not	smoke				Larceny	
2	Kassim	Kling	23	do.					do.	
3	Pakesa	do.	40	do.					do.	
4	Swe Khit	Chinese	33	3 hoons	8	Cooly	3½ drs.	drs 1.80	do.	Fat does not complain
5	Mer Hssain	Malay	Does	not smoke					do.	
6	Hassan	do.	Do.						do.	
7	Cheng Oh Hee	Chinese	27	5 hoons	6-7	do.	3½ ,,	,, 3.	do.	Fat and not sick.
8	Salat	Malay		Does not	smoke				do.	
9	Cheng ah koon	Chinese	25	4 hoons	3	Carpenter	4 ,,	,, 1.80	do.	Does not complain.
10	Tan Ah Chin	do.		Smokes but	is in	hospital			do.	
11	Then Glam	do.		Does not	smoke				do.	
12	Tay Shen	do.	73	2 hoons	14	Blk. smith	4 ,,	,, 1.20	do.	Old looking, fat, full of pain
13	Tay Kin Choo	do.	39	3 do	12	Cooly	3 ,,	,, 1.80	do.	Stout and healthy.
14	Lim Soon	do.	27	Does not	smoke				Highway	
15	Heng Ho	do.	24	do.					Robbery	
16	Leeah Chin	do.	23	5 hoons	2	Dyer	5 ,,	,, 3.	Larceny	
17	Tan Leek	do.	14	Does not	smoke	do.	1 ,,			Fat and healthy.
18	Abdulraman	Mal.	Do	not smoke						Fat.
19	Din Mahamat	Mal.								
20	Ong Goy	Chinese	35	3 hoons	5	Cooly	4 ,,	,, 1.80	do.	
21	John Lynch	Does	not	smoke					do.	Fat.
22	Tunah Heh		do.						do.	
23	Batos	Malay	do.						do.	
24	Abdullah	do.	do.						do.	
25	Tar Ton	Chinese	do.						do.	
26	Chim Ah hung	do.	do.						do.	
27	He Hoo	do.	do.						do.	
28	Esoop	Malay	do.						do.	
29	Lim Tih	Chinese	38	6 hoons	9	Huckster	3½ ,,		do.	Sickly looking.
30	Olly	Malay		Does not	smoke					
31	Kecha	do.		do.						
32	Vangou			do.						
33	Chin Gea	Chinese	29	2 hoons	14	Ricedealer	8 ,,	,, 1.20		Sickly looking.
34	Ung cha Ton	Smokes	but	is in hospital						

IN SINGAPORE.

The conclusions I would draw from the consideration of these tables and the facts already known regarding Opium smoking are, *first* that amongst the Chinese we have a powerful, and direct incentive to crime in the habit of Opium smoking, which, while it impoverishes the individual, yet requires great expense to gratify it.

Second, that the very indulgence of this habit to excess, is society's best protection from crime, by incapacitating the individual for mental and bodily vigour. Opium smokers are only able to perpetrate lesser crimes, see Table No. 1, being a list of persons sentenced to the House of Correction by the Police for vagrancy, suspicion of crime and misdemeanors not worthy of a higher tribunal. In this class of criminals 80 per cent are Opium smokers, but for crimes of greater moment, such as Highway Robbery, Burglary &c., certain ingenuity is required, method and calculation are needed, mental vigour and excitement of the passions are necessary, more than the debased Opium smoker is possessed of, the want of which therefore unfits him for carrying out any such enterprise requiring such adjuncts, and only leaves him capable of being a criminal on a small scale. This accounts for the criminals sentenced for Larceny, Highway Robbery, Burglary &c., and greivous offences against the person, being Opium smokers according to one Table in proportion only of 40, according to the other 50 per cent.

The *third* conclusion which I would draw is, that betwixt drunkenness and the habitual use of Opium, there is criminally a great difference. For instance, we find that the abuse of ardent spirits leads to crimes against the person, while the abuse of Opium leads to crimes against property. The victim to the use of ardent spirits commits his crimes while under their influence, the devotee to Opium while under its influence is at peace with all mankind, and dreams of nothing but his own happiness. The drunkard when not under the influence of liqour, may be a moral member of society, and is often a contrite one; but the Opium smoker at that time is scheming the violation of moral and social laws which when effected makes him a criminal, but enables him to gratify his appetite. This third conclusion is borne out by Table No. 6 where we find out of 25, 13 are Opium smokers,

of which 13, 11 are condemned for offences against property, and 2 against the person. In the same table we see 17 persons condemned for offences against property, of which 11 are Opium smokers, while of 8 condemned for offences against the person 2 only are addicted to the vice.

In the Table of the Pinang criminals we find that of 10 Chinese, 9 are Opium smokers, of these 9, 8 are for offences against property and one only against the person. The last remark that I have to make on this subject is, that when the criminal opium smoker overcomes the first shock resulting from the want of Opium, incarceration, expecially when combined with hard labour, much improves his physical condition, so that an Opium smoker that has been confined for some months is always to be known by his comparatively healthy appearance from one who has been recently admitted.

We have seen that abuse of Opium must be considered for the reasons advanced as a fertile cause of crime, tho' not to such an extent as its kindred vice drunkenness. If these reasons are correct and bear at all the impress of truth, we will have proverty as an established sequence to the use of the drug. This is not to be wondered at, when we see that men are so completely enslaved to it, as to consume in many cases $\frac{3}{4}$ths. of their wages, in not a few their entire wages, and in some cases *more* than their wages. This diseased habit is progressive, and the quantity taken must daily be increased to produce the necessary amount of ecstacy, but the capability of furnishing the means does not keep pace with the desire of consumption. The Cooly who just now while strong and vigorous, can easily earn $ 6 a month, has only to commence Opium smoking, and in 2 years he will not receive more than $ 4, but still he will smoke his quantity, and as years roll over his head, he finds that owing to his vice, he no longer can endure the toil that formerly was as child's play to the strong man; but still requiring to keep up the amount of excitement, he has to lessen the expenditure for clothes, then for food and then the quantity of Opium itself, until worn out, exhausted, and diseased he finds himself the inmate of a Jail, or Poor house.

If poverty in this country was to be succoured as in Great Britain

we would have as public burdens some thousands, but from many causes the open hand of charity has been closed, the springs of compassion for the poor dried up, and it was not until the horrid spectacles of miserable Chinese daily crawling in front of our doors, exposing their loathsome sores and leprous bodies, and polluting the air we breathed, it was not until these wretched beings without food or friends, and deprived by the Almighty of the power of supporting themselves, laid themselves down, and died in our streets of disease and starvation, then, and not till then, by the active *philanthropy*, of one or two individuals, was a shed erected to keep out of sight these disgusting paupers, but which philanthropy has now, since the novelty is over, dwindled down to the monthly contribution of $14,—the sum total of the public charity of Europeans to the poor of the country they live in. In this miserable abode we have two classes of men, yet united in the same individuals. We have the poor, and we have the diseased, constituting the only class of poor that can almost claim our sympathy here, the *diseased poor*. When I examined them there were present 125, of which number 70 were Opium smokers, and 55 were not, or would not acknowledge to it, and whose protestations were vouched for, by their comrades; of these opium smokers, some, previous to their entrance, were reduced to consume the Samshing or Tye Tinco, and all who at present were able to use Opium, either used that form, or the Tinco, or Chandu in very reduced quantities. The total daily consumption of these paupers before their entrance into the hospital, was 337 hoo ns, giving an average daily consumption to each Opium smoker of 4, $\frac{81}{100}$ of a hoon, being nearly the average consumption of the opium smoker at large. The greatest amount consumed by one individual amounted to 2 chin daily, but at that rate his finances soon failed him and five hoons was his quantity shortly before he became an invalid. A second consumer of a like quantity received $ 15 monthly in wages, or rather his profits amounted to that sum, from which he paid $12 for opium. Among the 62 Opium smokers, I find the total daily consumption of chandu, to be 107 hoons, which, at 60 cents monthly for each hoon consumed daily, will make $184. 20, as the value of the opium used by

these 62 men, whose wages amounted to $247. 50, or individually each man consumed opium to the amount of $2. 97c', while his wages amounted to $3. 97c' leaving him with a balance of $1 to feed, clothe and house himself, in fact for every other purpose that money is required for, but some did not confine themselves to their wages, but actually exceeded them, as is shown in the following Table.

Table No. 7.

	Quantity of Opium consumed daily.	No. of years addicted to the vice.	Wages.	Excess of Expenditure over Income.
1	6 hoons	7 years.	$2. 80	$ 1. 40
2	6 "	3 "	2.	1. 60
3	4 "	5 "	2.	40
4	6 "	8 "	3.	60
5	7 "	20 "	4.	20
6	5 "	10 "	2. 50	50
7	4 "	7 "	2.	40
8	5 "	10 "	3.	Income and Expenditure equal
9	4 "	5 "	2.	$ 40 Excess.
10	5 "	10 "	2.	1.
11	5 "	8 "	3.	Equal.
12	6 "	10 "	3.	60 cents Excess.
13	5 "	15 "	3.	Equal.
14	5 "	25 "	3.	ditto
15	7 "	22 "	3.	Dr. 1. 20 Excess.

To a moral certainty these men were worthy of a Jail.

This class, and these few of this class are all that I can statistically prove to be mainly indebted to their Opium smoking for their poverty, but how many more can be truly supposed to be so when it is borne in mind that perhaps 15,000 of the adult population are addicted to the vice, and that above $ 400,000 are annually so consumed; surely this is enough to improverish a people that number little more than 65 to 70,000. These 62 Paupers received at one time more than the average amount of wages current at present in Singapore, quite sufficient to have kept them comfortable, and fed, and clothed their families; now their existence is dependant on charity, and that charity allows them their rice and 5 doits daily or $¼ per month. Thousands who are not inmates of this wretched abode are not better off, for what they have beyond that allowance is spent in chandu, the only difference is that not being incapacitated by diseased they can

work for that sum while the disease pauper has it given him. This subject I may finish in the words of Mr. Ko King Shan who says "it impedes the regular performance of business, those in places of trust who smoke fail to attend personally even to their most important offices. Merchants who smoke fail to keep their appointments, and all their concerns fall behind hand. For the wasting of time, and the destruction of business the pipe is unrivaled." The wealthy Hong merchants who became bankrupts at Canton were nearly all Opium smokers.

CHAPTER VIII.

THE HABITUAL USE OF OPIUM AS AFFECTING INSURANCES.

Before an Insurance office will undertake to pay a sum of money on the death of an individual, they desire correct answers to be given to certain queries, and as this is an agreement entered into betwixt the Insurance Company on the one hand and the insured parties insuring on the other for a mutual benefit: it is always expressed or understood that Policies on lives are vitiated by fraud or falsehood as to the health of the individual insured. Two queries are generally put amongst others; one is, are his habits in every respect strictly regular and temperate? the other, are there anything in his form, habits of living or business, which your are of opinion may shorten his life? If the insured has been using Opium as a luxary for a short time it must be reckoned as a habit, and it is left for the medical man to determine whether that habit is a prejudicial one to life or not.

When a student in Edinburgh 12 years ago, it was usual in treating this question to remark that the use of Opium did not shorten man's life, that such an idea could only have originated from those who had not examined the subject, and who trusted entirely to the extravagant relations of travellers in the east; and a triumphant appeal I have heard more than once made to the case of the Earl of Mar, who, unknown to the Insurance Office, used laudanum for 30 years while it was stated he led a temperate and highly active life. Professor Christison was brought forward by the party, who wished

to prove that the habitual use of Opium did not shorten life, and to the best of my belief he gave it as his opinion that while the abuse of Opium rendered life miserable it did not shorten it; a contradiction which the talented Professor ought not to have been guilty of, and which in a late edition of his work on poisons, he endeavours to smooth over.

Professor Christison says "the general impression is that the practise of Opium eating injures the health and shortens life. But "the scientific Physician in modern times, has seen so many proofs "of the inaccurracy of popular impressions relative to the operation "of various agents on health and longevity, that he will not allow "himself to be hastily carried along in the present instance by vague "popular belief. The general conviction of the tendency of Opium "eating to shorten life has obviously been derived in part from the "injurious effects which Opium used medicinally has on the nervous "system, and functions of the alimentary canal, and partly on the "reports of travellers in Turkey and Persia, who have enjoyed opportunities of watching the life and habits of Opium smokers on a "great scale. The statements of travellers, however, are so vague "that they cannot be turned to use with any confidence in a scientific inquiry."

The Professor then makes a few quotations from a few Authors who have written on this subject, and who have expressed their opinions strongly, and without equivocation of the deleterious effects attending the use of Opium, even quoting Mr. Madden, a recent and *professional* authority, who states that an Opium eater seldom reaches the age of 30 if he commences the practise early. "But "on the other hand a few late observers deny altogether the accuracy of these statements; to this number belongs Dr. Burnes who "says "this powerful narcotic does not seem to destroy the powers "of the body, nor to enervate the mind to the degree it might be "imagined." Without impugning this qualified assertion of Dr. Burnes I believe there are two reasons which may have influenced his opinion. The first and most probable reason is that Dr. Burnes living at the Court in Cutch in an official capacity seldom or never

saw the Opium eater except in his state of ecstacy, for Professor Christison say "that Insurance Companies and Insurance Physicians ought to be aware that not a few persons in the upper ranks in life are confirmed Opium Eaters, without even their intimate friends knowing it, and the reason is that at the time the opium Eater is visible to his friends, namely, during the period of excitement, there is frequently nothing in his behaviour, or appearance to attract particularly attention." The second reason is that with the people who were the subjects of observation of Dr. Burnes, there is really not the misery produced as we have either with the Turk or the Chinese, and which I attribute in a great measure to the easily digested and highly nutritious food which they take with their Opium. A large quantity of warm fresh milk being generally drunk, and a few rich cakes eat, after each dose. The other authority, Dr. McPhearson of the Madras Army, is determined not to be run away with by the popular opinion that the habitual use of Opium injures the health, and shortens life, for, says he "if such was the case we should expect to find the Chinese a shrivelled, emaciated, idiotic race;" but pay attention to the Doctor's powers of observation, which seem to be without an eye to the shading of the picture; on the contrary, writes he, "although the habit of smoking Opium is universal among the rich and poor we find them to be a powerful, muscular, and athletic people, and the lower orders more intelligent and far superior in mental acquirements to those of corresponding rank in our own country." When the Doctor hazarded the assertion that the use of Opium was universal, he ought *not* to have trusted to his own observations, for if he had made proper enquiries, he would have found that while the population of China may be said to be about 400,000,000, the number of Opium smokers according to the highest estimate is little more than 3,000,000. It is therefore not to be surprised at that during the Doctors 2 years sojourn in China, he supposing every man to be an Opium smoker should deny its injurous effects when he saw nothing but men with power, muscle, and activity, instead of drivelling idiots, meagre in their look, "whose sharp misery had worn them to the bones." Now if the Doctor, instead of imagining every good

looking chubby-faced fellow to be an Opium smoker, had actually, by some means or another, attended the places where the Opium smokers were accustomed quietly to resort to, far different would have been his opinion; something it would have been in the strain of Doctor Oppenheim, whose admirable treatise on the state of medicine in Turkey contains this vivid description of the Opium eater. "The habitual Opium smoker is instantly recognized by his appearance; a total attenuation of body, a withered yellow countenance, a lame gait, a bending of the spine, frequently to such a degree as to assume a circular form, and glassy, deep, sunken eyes, betray him at the first glance. The digestive organs are in the highest degree disturbed; the sufferer eats scarcely anything, and has hardly one evacuation in the week, his mental and bodily powers are destroyed, he is impotent. By degrees, as the habit becomes more confirmed, his strength continues decreasing, the craving for the stimulus becomes even greater and to produce the desired effect the dose must consequently become augmented. After long indulgence, the Opium eater becomes subject to nervous, or neuralgic pains, to which Opium itself brings no relief. These people seldom attain the age of 40, if they have began to use Opium at an early age." Surely such a testimony as this is more worthy of consideration than the observations of Dr. Mc Pherson.

Dr. McGregor, a professional authority, in his "History of the Shikhs" makes mention of their habit in the following terms. "Most of the Shirdars are under its influence or that of opium for 18 hours out of the 24. Their early use of both the spirit and the drug renders them indispensable through life, if deprived of their usual dose the Shikh is one of the most wretched beings imaginable, before engaging in any feast, the Shikh takes his opium by which he is for a time excited; but this is soon followed by lungour, and inactivity. Talking of Rangeet Sing who was at that time labouring under paralysis from which eventually he died, he says, he still used opium, so that little could be expected from remedial means." From this disease accelerated by the use of opium Rangeet Sing died in the sixtieth year of his age. Dr. McGregor further adds "that the

Shikhs forbid the use of tobacco by the tenets of their religion; but they find a ready substitute for it in opium, which is consumed in great quantities throughout the whole of the Punjaub, as well as among the protected Shikh states. While under the effects of this drug the Shikh is a very different person, to the same individual before he has taken it. In the former instance he is active and talkative, in the latter lazy and stupid. When the habit of eating opium has been once induced it is well known how difficult it is to throw it off, and of this fact Runjeet Sing was well aware for although he has been told repeatedly how pernicious the effects of opium must be to his complaint, still he cannot resist the daily use of it."

Professor Christison having satisfied himself that Dr. Burnes and Dr. McPhearson's observations are more to be trusted them the mass of evidence on the contrary side, continues observations in suppor of his theory, remarking that " the familiar effects of the medicinal use " of opium in disordering the nervous system and the digestive or- " gans constitute a better reason than the loose statements of eastern " travellers for the popular impression of the danger of its habitual " and long continued use. Yet this consideration ought not be al- " lowed too much weight because the functions of the nervous sys- " tem and digestion may be deranged by other causes, for example " by Hysteria, without necessarily and materially shortening life, it " is desirable if possible to appeal to precise facts."

" The following is a summary of 25 cases the particulars of which " I have obtained from various quarters, the general result rather " tends to throw doubt over the popular opinion."

These cases collected partly by the Professor and partly by Dr. Tait the Police Surgeon in Edinburgh for the purpose of establishing their particular doctrine, are little adapted to do so. All that they ought to claim is that many of the individuals lived to a good age, there being 15 out of the 25 that reached the age of 50 and some lived a little beyond it; but this is a feeble argument to establish anything, it would be requisite to shew that these individuals would not have lived longer had they not been addicted to the habit. Moreover many of these cases picked to serve their purpose do not at

all show impunity to disease. For instance case No. 2 dies from consumption at the age of 42, but nothing more is added except that for 3 years she had taken Opium in a solid form and led a licentious life. Case No. 3, is that of a well known literary character who is said to have enjoyed *tolerable* good health. Case No. 4 a lady dies about 50 and has taken laudunum for about 20 years, but concerning her health, her feelings, or her death nothing is recorded. No. 6 a lady about 60 gave it up after using it 20 years during which she enjoyed good health and subsequently resumed it. Now with Professor Christison's leave I would doubt one or two things in this case, first I question if one could at the age of 60 give it up after using the drug for 20 years, second, why was it given up? either it was doing bodily harm, or it was considered as an evil habit, if either why was it resumed? simply in my opinion because however much harm it occasioned yet the discontinuance of the habit caused more misery, and suffering. No. 7 is the case of the earl of Mar who died from jaundice and dropsy, two diseases that frequently cut off Opium eaters. I am sorry that the limits of this paper will not allow me to analyze the remaining cases, but they are much after the fashion of the ones quoted. Now let me ask the candid reader if I cited an equal number of cases of men who had reached a similar age, with as few complaints, yet were habitually intemperate, would I on the strength of these cases he believed when I asserted that the evil habit of intemperance did not shorten life. I should be laughed to scorn, and deservedly so, and so ought he, who asserts that the habitual use of Opium does not shorten man's life, supposing he was as well acquainted with the effects of Opium eating as dram drinking.

Truly it is impossible to say positively when a man's life is shortened by human means, but when you see a shrunken, shrivelled wretch, attenuated to a skeleton, but not with years; whose eyes are dim, tho' not with age, yet sunken, glazed and rheumy; when you find that he can scarcely drag his limbs from weakness, or move his body from pain; when he complains of feverish, restless sleep, and wakens giddy and sick, to loathe all food, or anything but the pipe, when his bowels are often confined for 10 days, then loose as often

in a night, with all these symptoms and many more, would a man in his senses deny the misery of that man's life, or would it require a second Daniel to prophesy that the sun of his existence would prematurely be set.

Within an hour I could produce a thousand of such creatures, and if I stood at the door of an Opium shop and watched those that entered, out of the 100 would be found at last 75 or 80 whose appearance would not require the confession that their health was destroyed, and their mind weakened, since the day that they were cursed with the first taste of an Opium pipe. To finish this subject let me record my opinion, the result of extensive investigation, *that the habitual use of Opium, not only renders the life of the man miserable, but is a powerful means of shortening that life.*

As a medical man in the course of these investigations I could not but be struck with a series of facts which I found so frequent and so marked as to compel me to draw this inference that the *long continued use of Opium leads to impotence in the male, and sterility in the female.* Some writers in treating this subject mention that among narcotics Opium leads to anaphrodisiasm, but they lay but little stress on it, giving tobacco the first place in the class of medicines producing such an effect. If such was the case we would have in tobacco a preventive check to an increasing population much more effective and universal than any which Miss Martineau has suggested. But tobacco has *not* the extent of power which opium has. My friend G. H. Smith, Esq., Surgeon at Pinang, in an admirable treatise on "Opium smoking in Pinang" published some years ago, and which I am sorry I have only been able to peruse an abstract of, calls the attention of those interested in the subject to this fact. He says, "it is however admitted by all that Opium smokers become impotent at a much earlier period than others" and even when children are born to them, they are he says "weak, stunted and decrepid" During the course of my investigations I found that the continued use of Opium diminished the venereal appetite in both sexes, one female only who had consumed the drug for 10 years said she still retained her youthful passions, in some men the desire remains, but the power of ful-

filling the act is gone. One Chinaman who keeps an Opium shop has been an inveterate smoker for 10 years, he has had 2 children only, one a little more than 8 the other 7 years old, his wife is young, and without blaming Opium he knows not how he has no more children.

Class.		Children before using Opium.	No. of children born subsequent to the use of Opium.
Chinese			
1	All under 30 years.	2	none
1		1	none
2		2	none
1		3	none
1		1	one
1		none	four 3 died
1		none	none
Malays			
1	under 30 years.	1	one
1		1	none
1		1	none
1		2	one
1		1	one

This table is constructed not from women of abandoned character, but of supposed respectability and who are married; from it is seen that out of 12, 6 had no children subsequent to the use of opium. One has no children either before or after, one has no children before commencing, but subsequently four, because co-eval with her marriage was the commencement of the vice. It is difficult for a writer on this subject to convey to his reader such a mass of facts as to compel him who reads to believe, but it is much more difficult for one who has investigated the subject to withstand being convinced, that the long continued abuse of opium deprives man of the power of fulfilling the chief purpose of marriage—the continuation of the species. In this island, if the present number of inhabitants were not to be kept up or increased by the monthly immigrations which take place from China, and the vice of opium smoking not depressed or diminished; such would be its effects on the population that the present race could not by the births, compensate for the deaths, and in the course of a few generations the race would become extinct or confined to a few families. This is a subject well deserving the attention of the Political Economist.

CHAPTER IX.

THE EXTENT OF THE EVIL OF OPIUM SMOKING IN SINGAPORE.

In the first part of this Chapter I will endeavour to arrive at the most probable extent of the evil of opium smoking, a task which is attended with some difficulty from the foolish suspicions of the opium Farmer, which lead him to fancy from my enquiries that I wish to obtain all the information I can, previous to renting the Farm myself. Nothing will make him believe the contrary, so that although called upon by the Hon'ble the Resident Councillor, to give me all the information in his power, except that touching the private affairs of the farm, he prefers to distort the truth rather than refuse the request of the Hon'ble the Resident Councillor and has given me statements, which if I credited, would lead me far astray. His purpose, acting on the idea mentioned, is to make the expenditure necessary to carry on the Farm, very great, and the quantity of opium sold very small, so that a clear loss must be the result. For instance he gave me as the quantity of opium consumed for 1845, 94½ chests, retailing which at $ 1. 40 a tael (or 1⅓ oz.) would be $ 116,424 as his gross income, his expenditure being for Rent of Farm about $ 9,000 ₱ mensem, and the value of the opium $ 56,700, making the total annual expenditure $ 164,700, leaving a balance against him of $ 48,324, in addition to the expences of the establishment &c. Seeing how false these statements were and how fruitless would be the attempt to extract any correct information from him, I threw him entirely overboard; and will endeavour to show by other data the extent of opium smoking in Singapore. By means of the annual sale of the Opium Farm, we will have a pretty good idea of the progress of opium smoking. The farm was established in 1820, but the first registered sale was in 1822.

1822-23	Opium Farm rented monthly at	$	1,615
1823-24	,, ,,		2,960
1824-25	,, ,,		1,925
1825-26	,, ,,		2,032

1826-27	Opium Farm rented monthly at	$	2,050
1827-28	,,	,,	2,060
1828-29	,,	,,	2,720
1829-30	,,	,,	2,060
1830-31	,,	,,	3,270
1831-32	,,	,,	2,960
1832-33	,,	,,	3,440
1833-34	,,	,,	4,000
1834-35	,,	,,	5,060
1835-36	,,	,,	4,800
1836-37	,,	,,	4,570
1837-38	,,	,,	4,570
1838-39	,,	,,	4,860
1839-40	,,	,,	4,050
1840-41	,,	,,	5,440
1841-42	,,	,,	6,250
1842-43	,,	,,	6,347
1843-44	,,	,,	8,990. 45
1844-45	,,	,,	8,990. 45
1845-46	,,	,,	8,991. 35
1846-47	,,	,,	7,500

1822-23	*Monthly* rent of Farm	$1,615	and yearly	$19,380	Comp'd Interest @ 10 ₱ Cent ₱ Annum for	25	years	$	212,289
1823-24	do.	„ 2,960	„	„ 35,520	do.	„ 24	„	„	349,823
1824-25	do.	„ 1,925	„	„ 23,100	do.	„ 23	„	„	206,681
1825-26	do.	„ 2,032	„	„ 24,384	do.	„ 22	„	„	198,458
1826-27	do.	„ 2,050	„	„ 24,600	do.	„ 21	„	„	182,021
1827-28	do.	„ 2,060	„	„ 24,720	do.	„ 20	„	„	179,375
1828-29	do.	„ 2,720	„	„ 32,640	do.	„ 19	„	„	200,814
1829-30	do.	„ 2,060	„	„ 24,720	do.	„ 18	„	„	164,375
1830-31	do.	„ 3,270	„	„ 39,240	do.	„ 17	„	„	198,325
1831-32	do.	„ 2,960	„	„ 35,520	do.	„ 16	„	„	163,198
1832-33	do.	„ 3,440	„	„ 41,280	do.	„ 15	„	„	172,430
1833-34	do.	„ 4,000	„	„ 48,000	do.	„ 14	„	„	182,270
1834-35	do.	„ 5,060	„	„ 60,720	do.	„ 13	„	„	209,611
1835-36	do.	„ 4,800	„	„ 57,600	do.	„ 12	„	„	180,767
1836-37	do.	„ 4,570	„	„ 44,840	do.	„ 11	„	„	127,926
1837-38	do.	„ 4,570	„	„ 44,840	do.	„ 10	„	„	116,297
1838-39	do.	„ 4,860	„	„ 58,320	do.	„ 9	„	„	137,621
1839-40	do.	„ 4,050	„	„ 48,600	do.	„ 8	„	„	104,174
1840-41	do.	„ 5,440	„	„ 65,280	do.	„ 7	„	„	127,208
1841-42	do.	„ 6,250	„	„ 75,000	do.	„ 6	„	„	132,865
1842-43	do.	„ 6,347	„	„ 76,164	do.	„ 5	„	„	122,661
1843-44	do.	„ 8,990. 45	„	„ 107,885. 40 cts.	do.	„ 4	„	„	157,954
1844-45	do.	„ 8,990. 45	„	„ 107,885. 40 „	do.	„ 3	„	„	143,594
1845-46	do.	„ 8,991. 35	„	„ 107,896. 20 „	do.	„ 2	„	„	130,553
1846-47	do.	„ 7,500	„	„ 90,000	do.	„ 1	„	„	99,000
								$	4,200,290

The reader will see that the rent so derived has gradually increased, slow, hut beautifully sure, except in the last year when it has fallen $ 1,491. 35cts. This fall is in common with the other farms, shewing that the decrease was not so much owing to a perception of the evil by the opium smokers themselves, as to the general distress which prevailed among the working orders and which prevented the gratification of their habit to the usual extent.

	Monthly rent of opium.	Spirit.	Pawnbrokers.	Markets.	Toddy and Bang.	Seere.
1845-46	$ 8,991. 35c	$ 4,230	$ 362	$ 1,065	$ 211	$ 1,290
1846-47	7,500. 00	3,500	535	945	185	910
Decrease	1,491. 35	730	..	120	26	380
Increase	..	..	173	..	..	..

The very fact of the increase of the Pawnbrokers Farm shows the distress of the poorer class.

If we take the Government revenue for the 3 years of 1843-44, 44-5, 45-6 it is only a trifle less than $ 9,000 monthly, $ 9,000

While the expences of the Opium Farmer's establishment are not under $ 800 monthly, ... „ 800

The No. of chests of opium necessary to be sold to make up this revenue is 16 at $ 600 .. .. .. „ 9,600

$ 19,400

16 chests each containing 40 balls and each ball giving 22 taels of Chandu, each tael being equal to 1⅓ oz. which at the Farmer's selling price of $ 1. 40 a tael will realize, ... „ 19,712

Leaving a balance of monthly profit of .. .. $ 312

which is far within the mark.

According to Mr. Kong Tuan, who was for some years the Opium Farmer, during certain months of the year, 810 taels of Chandu or prepared opium were daily sold; these months were when the Junks were here; during the other months from 4 to 500 taels was the consumption. This would require 20 chests, and would give a gross revenue to the farmer of, ... $ 24,640

While his expenditure would be rent of Farm

$ 9,000, and expences $ 800, . ..	$ 9,800	
20 chests of Opium at $600, ...	12,000	
		„ 21,800
Leaving a balance of, ...		$ 2,840

for profit and many contingencies.

And this profit is not rated by any means highly, as it is known that in one year the clear profits amounted to $ 30,000. Assuming that at present 20 chests are consumed monthly, I believe I am much within the mark. Our next object is to determine what is the average consumption of each opium smoker.

	No. 1.			No. 2.			No. 3.			No. 4.	
1847. June.	Opium	Men	Day.	Opium	Men	Day.	Opium	Men	Day.	Opium	Men
1	8.75	154	1	1.75	60	1	3.50	110	1	1.64	47
2	3.50	77	2	1.75	54	2	1.75	64	2	1.67	44
3	1.75	45	3	1.95	65	3	1.75	56	3	1.67	49
4	3.50	90	4	1.75	56	4	3.50	121	4	1.67	49
5	8.75	158	5	1.75	60	5	1.75	49	5	1.67	55
6	3.50	89	6	1.75	46	6	1.75	57	6	1.67	54
7	1.75	49	7	1.75	55	7	1.75	51	7	1.69	51
8	3.50	87	8	1.75	50	8	1.75	60	8	1.69	50
9	8.75	149	9	1.75	58	9	3.30	124	9	1.69	41
10	3.50	84	10	3.50	112	10	1.75	50	10	1.69	51
11	8.75	184	11	1.75	59	11	1.72	49	11	1.72	56
12	3.50	89	12	1.75	42	12	3.30	117	12	1.72	50
13	8.00	140	13	1.75	45	13	1.65	58	13	1.72	50
14	3.50	80	14	1.75	59	14	1.65	54	14	1.72	51
15	3.50	89	15	3.00	151	15	1.65	63	15	1.75	50
16	8.75	156	16	1.65	55	16	3.30	89	16	1.75	49
17	3.50	80	17	1 65	58	17	1.65	56	17	1.75	51
18	8.50	136	18	1.65	57	18	1.65	55	18	1.75	53
19	3.45	80	19	3.30	121	19	3.30	110	19	1.75	52
20	8.62	180	20	1.65	58	20	1.65	48	20	1.75	48
21	6.90	170	21	1.65	48	21	3.30	91	21	1.75	48
22	6.60	177	22	1.65	58	22	1.65	53	22	1.75	44
23	4.95	137	23	3.30	116	23	1.65	49	23	1.75	46
24	3.30	78	24	1.65	58	24	3.30	109	24	1.75	52
25	8.25	137	25	1.65	51	25	1.69	60	25	1.75	50
26	1.65	40	26	1.69	52	26	3.38	83	26	1.72	43
27	9.99	170	27	3.38	109	27	1.75	72	27	1.65	40
28	3.30	78	28	1.75	58	28	1.75	56	28	1.65	50
29	8.25	128	29	1.75	52	29	1.75	63	29	1.69	40
30	3.30	78	30	3.50	100	30	3.50	89	30	1.75	46
	162.91	3383		61.62	1973		67.79	2166		51.84	1460
	daily average			daily average			daily average			daily average	
	1.81	112.76		3.15	65.76		3.13	72.02		3.56	18.66
	of each man			of each man			of each man			of each man	

By this table we see 299 people are in the daily habit of visiting these Opium shops, and that they consume 1144 hoons daily, giving an average of 3, $\frac{82}{100}$ hoons to each individual of pure chandu.

229 persons frequenting the 4 opium shops consume daily, ...	1,144	hoons.
62 Opium smokers in the pauper shed, ..	307	,,
112 Criminals	631	,,
130 Opium smokers at large	1060	,,
603	3,142	

By this we see that 603 Opium smokers consume daily 3142 hoons of chandoo and Tinco, or on an average each uses $5\frac{1}{5}$, of a hoon of Chandoo and Tinco. From this calculation most carefully made I would say that each Opium smoker in Singapore uses $5\frac{1}{5}$ hoon of Chandu and Tinco, of which $\frac{1}{3}$rd. is Tinco.

20 Chests each containing 40 balls .. give .. 800 balls
800 Balls each give 22 taels of Chandu do .. 17,600 taels
17,600 taels=176,000 chin=1,760,000 hoons. . 1,760,000 hoons

20 chests will give 1,760,000 hoons of Chandu and to this quantity add one third for Tinco and Shamshing will make 2,346,666 hoons of Chandu and Tinco consumed in the month, or 78,222 hoons consumed daily, dividing which by $5\frac{1}{5}$ hoons as the daily average allowance of each Opium smoker will give 15, 043 as the number of habitual Opium smokers in Singapore.

This number of 15,000 Opium smokers is I conceive much within the mark, as I am inclined to think that the smuggling which still to some extent exists would make with the Farmers consumption one fifth more; formerly smuggling was carried on to a great extent, so much so as to deprive the farmer of much of his revenue, and entail a loss of nearly $ 20,000, yet at that time from 20 *a* 25 chests were used by the Farmer monthly. We have shewn that the gross income of the Farmer from pure Chandu, amounts to $ 24.640 monthly, but much more is spent by the Opium smoking public who pay 8 per cent on that to the retailers of Opium, which will make $ 26,611. 20 cts. In addition they pay at least one third on the first amount for Tinco and Samshing. the perquisites of the Retailars

of Opium. The sum total consumed in Opium monthly will thus be about $ 34,824. 50 cts. or yearly $ 417,884. 30 cts, giving a monthly expenditure to each Opium smoker of $ 2. 31, cts.

If we contrast this dreadful vice as existing in Singapore with other places we will be surprised to see how fearfully we are ahead. According to the census of 1845, the last that was taken, there were of male and female Chinese 32,132, while the entire population was 57,421. At present the calculation I should say would be correctly stated as 65,000 for the entire population of the island with about 5000 more at a floating population of strangers either in Junks or prows and the inhabitants of several of the small islands adjacent to Singapore. Of this 70,000, 40,000 must be considered as Chinese.

Remembering that the number of Opium smokers amounted to 15,043, this will give one for every 4, $\frac{65}{100}$ of the population at large, but if we confine ourselves to the Chinese alone, who are the principal consumers, then we have one in every *three*, and amongst the adults a little more than one in every two? Perhaps this awful proportion of persons given up to this vice may not strike the reader as great, from having been told of the universal adoption of the habit by the inhabitants of this island, but the same has been said of China, and what do we find there? that in 1845, 40,000 chests were consumed, and allowing 3 candarines of pure extract to each man which is about the same quantity of Chandoo and Tinco, which I have proved each opium smoker on an average uses in Singapore, there will be 3,000,000 of Opium smokers in that vast empire, a number that is sufficient to astonish him who is not acquainted with the subject, but great as this number is, the proportion of Opium smokers in China compared with the inhabitants, only is as 1 in 133, reckoning the population at 400,000,000. But if the habitual use of Opium was carried on to the same extent in China as we have it in Singapore, there would be 92,307,692 Opium smokers where at present there may not be more than 3,000,000.

In Java and Madura the following is a correct statement of the quantity and value of the Opium farmed by Government for several successive years.

	Quantity of Opium paid for by the farmer monthly.	Value.	Yearly amount in quantity and value.
		Rupees.	Rupees.
1842	3,555 Catties.	736,610 Copper *f*——— 613,860 Silver.	12,660 { 8,839,680 Cop. *f*——— 7,366,320 Sil.
1843 1844 1845	3,645 „	765,450 Copper *f*——— 637,875 Silver.	13,740 { 9,185,100 Cop. *f*——— 7,654,500 Sil.
1846	3,715 „	780,150 Copper ——— 650,125 Silver.	4,658 { 9,361,800 Cop. *f*——— 7,801,500 Sil.
1847	3,381 „	*f*591,675 „	10,572 *f* 7,101,100 Sil.

Taking the average of these years we find that there are 3,597 catties of legally farmed Opium consumed by the inhabitants of Java and Madura. Supposing that the farmer of Java is not capable of producing more Chandu from a given quantity of Opium than the Singapore farmer, and taking the 3,597 catties as equivalent to 36 chests, this will give 3,168,000 hoons to which add $\frac{1}{3}$ or 1,056,600 of Tinco, will make in all 4,224,000 as the monthly number of hoons consumed, or daily 140,806, dividing which by $5\frac{1}{5}$, the monthly allowance of a Singapore Opium smoker, will give only 27,076 Opium smokers, but as wages are much less, and thep rice of opium in Java much greater, it is more than probable that 3 hoons is the average quantity consumed by each Opium smoker daily, which will give 46, 933 Opium smokers, but as it is well known that smuggling is carried on to a great extent, it is more than probable that only one half of the Opium consumed passes through the Government. A strong fact occured the other day proving this, 15 chests of smuggled Opium being seized at Sourabaya. Reckoning that one half of the Opium consumed is smuggled, this will give 93,866 Opium smokers in Java, or 1 Opium smoker in 95 of a population of 9,000,000.

CHAPTER X.

ON THE BEST MODES OF REMEDYING THE PRIVATE AND SOCIAL EVILS OF OPIUM SMOKING.

Having examined the physical and moral evils resulting from the habitual use of Opium, and having seen how general, how almost universal, is the adoption of this habit by the inhabitants of this island, what remains for me to do in this paper is to shew the best manner of remedying the evil individually, by indicating the proper means for re-establishing the moral and physical health of him who once has given way and has sunk beyond his own power of elevation; but who still, not altogether enslaved, is yet desirous of being a man, and a social man again. After which, with all humility, I will endeavour to shew the policy which an enlightened and Christian Government ought to adopt to remedy a national disease, which promises soon to cure itself by carrying off all who are afflicted.

Hundreds I have met with during these investigations, who, having frankly denounced the evils attending the habit and as frankly confessed the miseries with which they were surrounded, yet had not the moral power to commence the attempt of breaking off their evil custom, from their dread of the greater misery which the first temporary deprivation causes. Neither is this to be slighted as death has ensued in many instances, from the too sudden relinquishment of the drug, a fact which both Drs. Oxley and Traill have testified to, and which I can corroborate. When death does not ensue the misery of the wretch is great and heart rending, and which no one could bear to witness who had the power of relieving, however concious of the final good it would do. Well do I remember, and my Friends who were with me at the time cannot but recollect, the Chinaman whom we got on the banks of the Sákodai to carry part of our luggage to Gunong Pulai. This man though an Opium smoker performed his task well, for not only did he carry double the quantity of any of the other coolies, but he was the first of them that reached the top of the hill. Next day our Malay servants told us that this Chinaman would die if not relieved, his Opium was expended and could not be replenished, he could neither eat nor drink, a

thousand pains racked his limbs, and a gnawing he felt in his stomach, as if it was another vulture preying on his intestines, life was to him no object, his wish was by lying exposed to the suns rays either to die or get mad, and the Malays had several times to remove him under a shade. By means of wine and tobacco we kept him up, though with some difficulty, until we reached a China Banksall when he got a supply of Opium and renewed his life.

Eighteen months ago a Malwa Opium merchant was wrecked on the coast of Cochin China, for weeks he subsisted on a little dry rice and water, as his caste would not allow him to cook his food under the circumstances in which he was placed, and such was the strength of mind of the man that he would have starved rather than have violated a tittle of his religions views; he wished to give up Opium, but here the strong man was weak, the iron nerved man was pliant as a womans will to his habit, and altho he had tried several times to give it up, being fully aware of the evil it was doing him, yet such was the misery that the temporary relinquishment caused, that he as often returned to it. He came to Singapore and hearing that I could by a wonderful medicine enable the Opium eater to throw off his habit, he applied to me, and I consented to cure him on the mutual understanding, that he was not to suffer the racking pains in his bones, and gnawing anguish at his stomach that he formerly had when he gave it up, while I stipulated that he in every thing was implicitly to obey my orders in eating and exercise, and not to be discouraged by a slight feeling of uneasiness, and by no means to touch Opium. He took 40 grains of solid Opium daily, 20 in the morning in the shape of 2 pills, and 20 before his evening meal, at these times I ordered him to begin with Battley's sedative solution . 1 dram

tincture of Opium	1 dram
tincture of gentian	2 drams
distilled water	1½ oz.

to be washed down with

essence of ginger	1 dram
an aromatic stimulating tincture	2 drams
water	1 ounce

This he repeated twice daily for some time, in the place of his forty grains of Opium; he was ordered at the same time to take gentle walking exercise morning and evening. To his astonishment this medicine answered all the purposes of the Opium, at the same time he was not racked with the pains which he had experienced, when he tried on former occasions to give up his dose, and in addition he felt stronger, able to eat more, and altogether much improved. He continued this course of medicine. I daily diminished the quantity of Battley and tincture of Opium, but increased the bitter Tincture of the first bottle, and the strength of the second bottle, until at last he had given up the use of the smallest quantity of Opium, while the place of the bitter tinctures was gradually taken by a decoction of Black pepper, Ginger, and Quassia, saving thus the sin of drunkenness: and 12 months after I had the satisfaction of receiving his salaam from Bombay, and of knowing that while he never touched Opium, he enjoyed the best of health.

The only other instance to my knowledge of a voluntary relinquishment of the drug, was in a cooly in my employment, who gave up opium for the charms of arrack, preferring the cheaper luxury of the two, by which he said he was a great saver, as he could for 4 fanams get druuk on arrack, while it cost him 8 to do the same with opium.

I have already mentioned that a female with the facileness peculiar to her sex sometimes devoted herself to opium, but could give it up for the sake of arrack. When under confinement, the criminal if he has friends to supply him, never gives up the habit; but wanting these and funds, he is obliged to relinquish the drug, when, if death does not ensue, great misery is experienced; but ultimately the result of his involuntary temperance is health and mental vigour. Several criminals from necessity having given up the Chandu, use the Tinco dissolved in arrack as a preventive to their great miseries, and this answers well, in fact, many medicines can be advantageously employed, if the following principles are kept in mind.

First. That it is impossible with safety to give up the habit at once, for this reason opium or its preparations must be administered, at first nearly in equal quantity to what the patient was in the habit

of taking himself, but which must gradually be diminished.

Second. From the enervating effect of the opium on the stomach, stimulants, and bitters must be administered, and which as the opium is decreased, must be increased.

Third. As the general system of the opium smoker has been deranged, and every organ and function of the body interfered with, so as to have produced a diminished tonicity of muscle and vigour of mind, exercise gradually increased and fresh air are necessary, and, with the poor, good nourishing food.

Fourth. As the mind is weakened, firmness, never very great in the native character, is much reduced. It is therefore necessary to keep up the hopes of the party by convincing them of the infallibility of the medecine, whose nature must not be disclosed to them.

Many trifling additions will suggest themselves in each individua case, but with the adoption of these principles, and the steady resolution of the patient, a perfect cure may be expected in 6 weeks or two months.

The last yet most difficult part of the subject consists in suggesting a general remedy for the extensive evil, or at least, the best means for moderating its intensity, and confining its range ; this of course must be a national work, which must emenate from, and be supported by the government, whatever aid may be derived from individuals or the public..

I cannot suppose after what has been written, not only by me, but by all who have touched on the subject of opium, when treating of India, China and Turkey, that one individual can be found to deny the evil effects of the habit, the physical disease it produces, with the prostration of mind, and the corruption of morals. All that I have done is to show that in this settlement of ours there is no difference in the vice, no dissimilarity in its results, that it is a fascinating, captivating allurement, which startles not its victim, till it has so entangled him in its mazes, from which there is no escape, until the time when, grasping crime with one hand and poverty with the other, he sinks into a premature grave.

I have endeavoured to trace the many offshoots that a question of

this importance and extent takes, which lead to the considerations of its affinity to drunkenness, its relations to crime and poverty, the subject of Insurance, and the continuation of the species, and lastly I have shewn its extent, that the habit consumes at least $ 35,000 per mensem and involves in its curse not less than 15,000 of the inhabitants of Singapore.

The question now arises, ought Government to interfere to remedy this state of things? And supposing that question is answered in the affirmative, is Government capable by its interference of lessening the evil?

All interference on the part of the Government for the suppression of opium smoking must be attended with a loss to the revenue, for in the present state of things an increased revenue, a priori, supposes an increased quantity of opium consumed. At present two feelings I believe actuate the Government, one is that by raising the value of the Farm and so increasing the revenue, they are most powerfully aiding the suppression of opium smoking, for if the Farm was but a nominal thing, the price of opium would be so reduced, as to be more accessable, therefore more consumed. The other feeling is, that the farm is a most valuable means of increasing the revenue, and the Farmer pays most handsomely for his monopoly, it is therefore expedient not to throw any obstacles in his way, or the rent may not be so productive.

Our worthy Governor in 1844, shortly after he assumed the reins of Government, was particularly struck with the immense number of opium and spirit shops, and in his report to Bengal, he mentioned that the number of Opium Shops formerly amounting to 72 had been reduced by him to 45, which reduction, he congratulated the Government instead of being attended by any bad effects had actually increased the revenue. The opium Farmer from that day limited the number of sign boards on which was written in legible English characters, " Licenced Opium Shop," and in the place of each taken down he hung up the gunny mat, and inscribed in Chinese characters the same thing, being delighted that he could please those in power at the same time that he suffered nothing by it, and now

the number of Opium Shops with English inscriptions is 45, with Chinese inscriptions about 40, making in all between 80 and 90. In fact without mincing the matter, the revenue is the first point of consideration, the morality, the second, and the farmer is allowed to do all he can to increase the consumption of the drug, and well and ably does he do so, for not content with being allowed 45 Shops to retail his opium, an immense number for such a small space as the limit of the town includes, he has multiplied them to between 80 and 90, so as to have one in every street, sometimes 2 or 3. He allows no distance to intervene between a man's house, and an opium shop, so that once the inclination is excited to try the "soul soothing drug" time shall not elapse to change his mind ere his purpose is effected; wherever a dense mass of beings are located, there are many shops, and wherever the hard working artizan is to be found there you have a shop ready to receive him, when, worn out and tired with his days work, he does not require much persuasion to step next door and try the meritricious temporary delight. Government, fully convinced of the immorality of Gambling, has not only put a stop to the public practice of it, but, by abolishing the Farm, has generously diminished the revenue. Cock fighting, a passion as great amongst the Malays as opium smoking is amongst the Chinese, has also been put a stop to, and, for the sake of peace and quietness, the prejudices and religions feelings of different classes of natives, have been and are daily interfered with, by the prevention of their processions, assemblies and festivals. From this it is evident that "cæteris paribus," whenever the government are convinced of the evil of a habit, or the immorality of a custom, then that habit is put a stop to, that custom prevented. Now gambling, cock fighting, in fact more serious offences are nothing to the evil of Opium smoking, and ought on that score to claim the serious attention of the legislation. How different would be the condition of the people of this island if instead of spending on Opium $ 417,884 yearly, they knew not the vice; that money hardly and honestly toiled for would be spent in clothes, in food and better houses, the men could afford to marry, a taste would be formed for finery, and something more would be required, than bare rice the

necessary of life; some little comforts would be wished for, and could be procured; instead of 40 or 50 living under one roof, too often a mass of iniquity, a man and his family, or one or two single individuals could afford to live in a house of their own. The attainment of comforts, where necessaries formerly could only be procured, would create an aspiration for luxuries, and once the man becomes dissatisfied with his lot and wishes to raise himself, that man's condition is bettered, and that improvement extending to the people at large, society would be benefited, and the phasis of this settlement undergo a decided improvement.

The present £ 417,884 spent in Opium benefits three parties only, the Government, the Farmer, and one or two merchants; but the benefit to the latter class can be so small, from the sale of 240 chests a year, that it ought never to weigh against the abolition of a vice so dreadful as Opium smoking, in fact in a selfish pecuniary point of view, the merchants as a body ought to be the persons to wish for the complete abolition of Opium smoking, as the money now used in purchasing the drug, would certainly be expended in articles giving much more mercantile profit, so that instead of receiving 3 per cent on £ 144,000 the price of the Opium, 7 to 10 or more per cent would be received on £ 417,884, which is the sum the Opium smoking public annually expend on the vice. The interest of the Farmer in such a question cannot be thought of, as he is created by the vice, and when "God" wills its suppression, he will not be required; the last party interested is the executive as respects the revenue.

The radical and effective cure of Opium smoking is the complete exclusion of Opium; but as long as it is manufactured, as long as the poppy gives forth its juice, and man is there to collect it, so long will it be supplied to its votaries in spite of pains, and penalties, imprisonment and death; no possible preventive force could put a stop to its introduction, the quantity consumed might be lessened, but that would be counterbalanced in a moral point of view by the establishment of smuggling and its consequent evils. No,—however much we may deprecate the raising of a revenue from such a source, fattening as it were on the miseries of others, I am, after much the

consideration of the subject, compelled to acknowledge that the wisest, most politic, and most moral measure, in the present state of things, is the farming of the monopoly of opium to the highest bidder, in the mode at present practised in Singapore, which is simply the letting the monopoly of opium smoking to one man, or a company of men, for the highest sum, subject to the known opium laws; by this procedure the largest sum is exacted by the Farmer from the public in order to pay the revenue and his own expences, and yet, that is not so outrageously immoderate as to tempt smuggling at all risks. When Mr. Kong Tuan had the Farm the retail price of opium was very high and smuggling was so great, that he was a loser by the speculation. By the Farmer who succeeded him, the price was lowered, so that he realized a handsome monthly sum of profit; and now the smuggling, by an excellent native judge of such matters, is estimated to be at present not more than from 3 to 5 chests a month. In Java the government rent the monopoly of the Farm to one or more, who not only take the Opium from them at the highest price, but the greatest quantity at that price; for instance the Farmer of this year has agreed to take the Opium at 175 Rupees silver, or 220 Rupees copper per catty, and so many catties monthly, the quantity I know not positively, but from the table given, I should say 3,500. Now it is the Farmer's interest to smuggle as much as he can, and pass that Opium off as legal Opium; the fact is, there is the inducement for smuggling in the difference betwixt 2100 Rupees the value of smuggled Opium per chest, and 17500 Rupees the value of legal Opium; this will account for the immense smuggling that is carried on in Java, and Madura, amounting, as I am told by one who is in the trade to nearly 400 chests per annum, that is about 300 chests of Turkey and 100 of Bengal. But while I admit and haply can acknowledge that our system is the best, and so good that I cannot hint an improvement, I must here stop and pass my veto against any encouragement of the Farmer, in his attempts to force the trade by multiplying the number of shops, and so increasing the facilities in obtaining the drug; in this case the judicial must neutralise the effects of the executive power, and however much the latter may plead for

the revenue, the former must turn a deaf ear to his entreaties and consult the moral and physical welfare of the people.

Having prepared the reader by these preliminary remarks for my suggestions as to the best means for remedying this general evil, I will step at once to the point by proposing that, first, having farmed the monopoly of the Opium at the highest rate short of encouraging smuggling, I would propose the enactment of a law to limit the number of Opium shops in town say to 10, and in the country to 20, further that this law enact that no Opium shall be consumed in any other house public or private, and that no Opium shall be sold in these shops, but what is consumed on the premises; second, that this law enact that the Farmers shall not sell any Opium less than one chest, saving what is to be used in the 10 shops in town and 20 in the country; third, that these shops shall be conspicuous, distinct, and detached from all others, accessible to all, and under the surveillance of the Police. By these means the facility for procuring Opium will be materially diminished, and depend upon it, the quantity used will be proportionally diminished. If a man who has not yet given himself up entirely to the vice, finds that instead of stepping next door to get a whiff, he has to walk half a mile, he will think twice of it and perhaps remain, and let him break the spell once or twice, he is saved. The workman who has toiled all day, when he finds he has some distance to traverse ere he can indulge in his love for the pipe may remain and try to take his supper, or be induced to listen to the prattle of his children until wearied with his daily labour he draws around him the curtain of repose. In fact it is well known to all those who have studied the question that the temptation to sin is as the facility of being tempted, hence the strictness which actuates an active, honest, magistrate at home, not to allow the number of spirit licences to be increased, and when numerous to have them diminished. Under this law I would prevent the introduction of females into Opium shops, where at present they abound; victims themselves to the sin, they are a powerful means of making victims of others. This terminates my proposed legislative interference with the Opium Farmer and smoker, the gist of which consists in raising the price of Opium to as great a height as possible and dimi-

nishing the facilities for obtaining it. But I would not stop here; but try if possible to prevent the young from treading on the footsteps of the old. I would endeavour, if I could not improve the present generation, to attempt that of the rising one. I would call upon all to join me in this laudable task, public and private men, Europeans and natives. I would call upon government aid in the formation of a society for the suppression of Opium smoking, by the aid of which society, tracts in Chinese and Malay, describing the misery and evils attending the use of Opium may be circulated far and wide. I would call upon all to discountenance the vice, and to set their faces against all who are addicted to it; and lastly I would call upon the influential Chinese, as Tock Sing, Kim Sing, Eu Chin and Whampoa, if they have a spark of fellow feeling, if they have any pride in the welfare of their country men or feel any shame in their debasement, to unite themselves into a society for the suppression of opium smoking, to enlist all who will, on oath truly and solemnly taken, swear to renounce the evil or never commence it, to whatever temptations they may be exposed, and who will further swear that they will use their utmost endeavours to induce others to join them in their laudable design. I would entreat the besotted father by the misery he himself endures to register his son. I would beg of a mother to exert her maternal power over her child when young, to keep it by this means out of this evil, rather than that it should grow old in vice and repay her with a curse. I would beg of a master not to employ a servant who is not enrolled, nor a merchant a cooly, in fact, I would not rest, until in this small island, throughout its length and breadth, every living soul who claimed a Chinese name was a member, and then with God's blessing a stop would be put to this awful depravity.

To those who have drunk deep of the evil, but who would wish to renounce it, I would beg of them to try the means I would now suggest that Government adopt, to rescue those who are not yet entirely lost, who have fallen, and would rise, but cannot of themselves. For some years past Government has received from opium smokers nearly $100,000 per annum. God knows what sins have been committed, what crimes have been perpetrated to furnish that amount;

who can tell what misery has been endured, what disease produced, what deaths have followed the means for raising such a sum, "but I think it more advisable to throw a pall over this hideous subject, and leave it to your imaginations." From this yearly tribute I would suggest that Government devote a portion, say two per cent only per annum, to furnish means for reclaiming the opium smoker. I have already in my suggestions as to the individual treatment of an opium smoker mentioned, how gradual ought the emancipation of the victim to be from his thraldom by continuing the opiate under another form and combined with such adjuvants as bitters, tonics, and stimulants. To the wretched poor, good food would be essential for their cure, but above all it would require a superintendent, to dispense these alleviating substitutes, who would not only do his duty, but do it enthusiastically, while the patients must have implicit confidence in his power. This superintendent would require 4 assistants under him, each attached to one station, the medicines should be made up by the superintendent, and committed to the care of his assistants, who ought to be educated Chinese, who could dispense to each individual applicant his daily substitute for the pipe. These stations ought to be in town at first, (if the system works well they can be extended into the country) in the localities where the greatest number of opium smokers are congregated, the applicants should pay their visits at a certain hour morning and evening, but different in the morning at each station, so as to allow the superintendent to see all the cases daily. The assistants ought to be able to take each individual case in writing, and they ought to be taught to be able to proportion the strength of the substitute, according to the extent that each applicant has taken the drug; but no more must they know, nothing of the ingredients, as it is advisable to shroud in mystery the nature of your remedies, for once your patients suspected they were taking opium, or its preparations they might fancy they were entitled to prescribe for themselves.

The moment it was publicly known to the opium smokers that Government had taken their case in hand, and would furnish them with a remedy to overcome their propensity, without entailing the

fearful misery which a temporary want inflicts on them, they will be found rushing to be relieved, and I firmly believe from what I have seen amongst the poor who frequent the Opium Shops, that when such arrangements are made, a thousand would be the applicants before 12 months had elapsed.

These suggestions, which at some future period I will enlarge upon, for they are nothing more, will I trust find favor in the eyes of the public, and of the Chinese in particular. But I look for support to the Hon'ble the Governor, who, since his arrival here, has ever shown himself a corrector of abuses, a zealous reformer of evil, who has ever been, and I trust ever will be an active advocate for whatever can advance the welfare of the inhabitants, and further the interests of this settlement. Nor am I afraid of losing the support of the Hon'ble the Resident Councillor, who will, I am confident, along with his piety as a man, throw in the support of his magisterial power for the reformation and ultimate welfare of 15,000 beings with whom he has been officially connected for so many years.

MALAY POEM ON NEW YEAR'S DAY 1848.

BY

ABDULLAH BIN ABDUL KADIR, MUNSHI.

سلامتله كيران كوين بقتوريا
سرت دڠن سنتوس ككل دالم مليا

سرة سلامة منتري دڠن اورڠبسر دي
يڠ ممرنتهكن سكل نڬرين دالم دنيا

تله مشهورله نما اڠكريس سمفي كمان٢
سكلين مڠتهوي مليا دان هينا

سكلين يڠدباوه بندير ان اد سمفرن
نمان ساڠتله هاروم لبه درفد بوڠا

سكل بڠسا فون تاكوت دان ڠري
سبب حكمن عادل كراجأنن بردير ي

ماسيڠ٢ فون دانڠله دري سكنف نڬري
راميله ساڠت نڬرين تياد ترفري

دڠركن خبر سوات بوريتا
بوكنن حكايت بوكنن چريتا

سكلينن اورڠ مليهت دڠن مات
سبب ايتوله اكو هندق بركات

كفد تاهن امفت فوله دلافن
سربيوون سده اكو لاينكن

تاهن مسيحي يڠ كوكتاكن
ايتوله شعير هندق كوكارڠكن

كفد سهاري بولن جناواري
هوجن فون لبت تياد تمفأ منهاري

سمالم٢من ايت سمفي فاڭي هاري
ماسيڠ٢ دڠن ماسم موكان تردير ي

اد يڠ هندق برلمبا كودا
يڠ هندق برلمبا فراهو سدهله اد

سموان دودق تندق تڠاده
اد اڠكريس اد كليڠ چينا فون اد

كمفرن فادڠ ايت سفرت قيامت
اورڠفون بركروس باڤق ساڠت

تيڠ فون اد تردير ي ترلالو بولت
براتس٢ اورڠ سكل بڠسا ممنجت

تيڠ ايت سده دلوس دڠن لمق
اورڠيڠ ممنجت ايتفون جاته باڤق

اورڠ ترتاوا فون سمفي سرق٢
كباڤتكن فول اورڠيڠ برسورق

اد فول لاڭي سوات حيران
اورڠ ماسق دالم ڬوني بركاون٢

سبب هندقكن وڠ سموان دتاهن
ملمفت٢له ماسيڠ٢ فرلاهن٢

اد يڠ جاته هابس لنتڠ فوكڠ
اد فول يڠدتولتكن اورڠ دري بلاكڠ

اد يڠتربالبق جاته كبلاكڠ
ربه رمفه تڠكڠ لڠكڠ

بوكنڽ مودا مندافت وڠ اورڠ فوته
دبوتڽ بدان سمڤي۲ لنتيه
قاوه برهمبورن سفرت برتيه
اورڠڤون جاته باݢون برتنديه۲

اد فاݢر بركليليڠ سده دبوبه تالي
دسيتوله اورڠ بركرومن باپق سكالي
برباݢي۲ بڠسا بركرومن ممكڠ تالي
اد كليڠ اد ملايو اد چينا اد بڠݢالي

ماد۲ دان سرجن مموكل اورڠ ماسق كنتڠه
سبب تاكوت دلڠݢر كودا اي ليغا
ݢادوهله اورڠ برلاري ترمڠه۲
اد فول يڠ جاته باݢون سنڠه

اورڠيڠ برماين ايت سمواڽ داوفه
اورڠيڠ دالم ݢوني دان ملمفة دان برلمبا
يڠ ممنجت تيڠ دان يڠبرلاري اد
دان يڠ ملمفت كايو ستڠݢي دادا

بودق۲ فون مڠݢلومڠ لمفور هابس
سبب دسيتو دچمفقكن دوية اوله اڠݢريس
مربوتله سكلينڽ دسيتو برباݢي جنيس
اد يڠترتاوا اد يڠ مناڠيس

بوڤين ريوه سفرت ريبوت
توا مودا كچيل بسر مربوت
جاته باݢون داتس رمفوت
اد يڠ كويق باجواد يڠ مڠݢربڠ رمبوة

سبنتر لاݢي توان وايس فون داتڠ
اياله منجادي كفلا ممكڠ وڠ
برفوله۲ كودا فون مڠيكوة دري بلاكڠ
سمواڽ كودا ايت اد اورڠ تڠݢڠ

اياله ممبري فرنته مڤورة لاري
اداله سؤرڠ۲ فوته برسما۲ فرݢي
دهادفن رومه توان الميدا سمواڽ برديري
داتوڽ سما۲ سكلينڽ برلاري

كودا ماتي اڤين تڠݢلله دبلاكڠ
اد فول يڠبرلاري لنتڠ فوكڠ
بوڤين سفرت ريبوت سكلين داتڠ
تتافي ايت سكالي تياد دبيلڠ

كريتا فلڠكيڠ داتڠ برتالي۲
سكلينڽ ايت برايسي فرمڤون باپق سكالي
تتافي كبا‌ڽقكن باتق دان فرمڤون بالي
ملينكن اورڠيڠ دايقن اكو بركچوالي

ماسيڠ۲ هندق منجادي مادم
تتافي دفاكين بدق موكان هيتم
دكنتيڠن رمبوتڽ سمواڽ برندام
اد يڠبرباجو خاس اد يڠبرباجو هيتم

ماسيڠ۲ مڠنتي دجنيلا كرينا
اد يڠ دتوتفڽ كاڤيهاڽ ماتا
فورا۲ اي تياد ماو بركات۲
اد فول يڠ كوليهت برماين ماتا

اورڠ كليڠ دان چينا باپق بركدي
اد يڠبرجوال كاچڠ اد كويه ميتي
مكانن دان مينومن برباݢي۲
كارن هاري ايتوله دوية سنت ترفاكي

MISCELLANEOUS NOTICES, CONTRIBUTIONS AND CORRESPONDENCE.

As circumstances have prevented our availing ourselves so soon as we desired of several notes and memoranda which we have received from J. B. WESTERHOUT Esq. Assistant Resident at Malacca, we cannot longer defer acknowledging his kindness, which was enhanced by his leaving it to our discretion either to insert them separately, or embody the information they contain in an account which we are preparing of Johore, including Malacca and Singapore. If we find it necessary to postpone this account we shall publish some of Mr. Westerhout's notes in an early number.

Dr. BLEEKER, Secretary of the Batavian Society of Arts and Sciences &c., has favoured us with several papers containing his latest contributions to the zoology of Java, for which we return our best thanks.

Our acknowledgments are also due to the Editors of the Calcutta Review, Journal of the Agricultural Society of India, and Tijdschrift voor Neerlands Indie, for the last numbers of these works.

THE JAVA EARTHQUAKE OF THE 16th. NOVEMBER 1847 FELT IN SUMATRA.

From the *Javasche Courant* of the 22nd. ult. we learn that the Earthquake of the 16th November extended to the southern part of Sumatra. At Natar in the Lampongs, on the same day about 38' past 10 o'clock a heavy shock was felt. 10 minutes later a more severe undulating motion was experienced, followed at intervals of 4 to 5 minutes by two very severe shocks, all in a direction from S. E. to N. W. In the morning a strong wind blew, but during the Earthquake it was perfectly calm The thermometer which at 9 o'clock stood at 79° F. rose to 85° Natar lies at the foot of Gunong Ráté,

whose form, as well as some sulphureous springs at its foot, indicates a volcanic origin.

This phenomenon is an addition to former proofs that the mountain chain of Sumatra, of which Ráté forms one of the first links, has a volcanic connection with the mountains of Java.

It is also mentioned that the Earthquake of the 16th. Nov. was felt in the Kampongs lying at the foot of Gunung Radja bassa.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

SKETCH OF THE PHYSICAL GEOGRAPHY AND GEOLOGY OF THE MALAY PENINSULA.*

THE Malay Peninsula, if we give the term its widest application, is disengaged by the Gulf of Siam from the broad mass of the general Hindu-Chinese Peninsula in about 13° 30' N. L. Its length is so great compared with its breadth, being nearly as 10 to 1, that it may be described as an irregular zone stretching from that latitude (Lon. 98°.. 100° 20' E.) through above 890 miles (Geo.) to within 1° 14' of the Equator (Lon. 103° 27'.. 104 17' E.) and dividing the sea of Bengal from that of China in their southern portions. Its base is a line extending from a point a little southwest of Bankok to the mouth of the Tavoy river, at right angles to the direction of its northern half. Thence it stretches almost due southward for about $5\frac{1}{2}$ degrees between the Bay of Bengal and the Gulf of Siam, at first gradually contracting its breadth from above 2°, that of the base, to $1\frac{1}{2}$° in 12° N. L., where the eastern coast suddenly retires at Kwi Point for about 40 miles, thereby reducing the breadth to about 1°, which it retains with little variation to the latitute of 9°. Here it again abruptly expands on the east into the Gulf of Siam, this expansion coinciding with the commencement of the second or southern half

* We have often had occasion to lament the meagreness of our knowledge of the Peninsula, but never more than in attempting to give a sketch of its physical geography and geology. The reader will scarcely consider the information conveyed as being sufficient to warrant such a title, and indeed there would be no excuse for venturing on the subject, if we did not think that such a general view of the little that we know, would better shew the extent of what we do not know, and tend to incite observation, than the publication of a long and dry catalogue of deficiencies and disiderata.

of the Peninsula, which is very decidedly distinguished from the northern by a difference in form and direction. It is to this latter half that the name of the *Malay* Peninsula should perhaps be restricted, as it indeed seems often to be by writers. The northern half is properly a long isthmus, that of Krá, connecting the Peninsular *Malaya*, (as it is sometimes called,) with the Hindu-Chinese region.

A knowledge of the mountain systems of the interior, which we do not possess, could alone enable us to describe the figure and direction of the Peninsula, so limited, in any other than an empiric manner. The eastern and western coasts are neither regular in themselves nor parallel to each other. But on both there are considerable portions having uniform directions, and some even parallel, so that, independenly of geological facts, we are impressed with a conviction that, despite all the observed irregularities in the external outline, the region has been moulded under some simple laws, and that probably one and the same law of direction will be discovered in Ligor and in Johore. A line drawn from the middle of the base of the Peninsula, limited as above, to the town of Singapore at its southern extremity, lies N. W. by N. . S. E. by S.: and this, although it divides it into unequal parts, may be considered the fairest approximation to the general direction. The northern part of the western coast nearly to Kedáh, or for 140 miles, is disposed on a straight line having nearly the same direction. A similar direction is resumed from the Dindings to Parcelar hill: and if the numerous islets off the northern coast be considered as a portion of the Peninsula, the latter line might be prolonged parallel to the former up to Junk-ceylon, so as to include almost the whole of these islands, and give a uniformity of direction to more than two-thirds of the western limit of the Peninsula. The very broken and irregular east coast opposite the northern portion of the west coast has the same general direction, and it shews itself more decidedly in the coast between the parallel of Pátání and that of Tánjong Dungan or P. Varela. The portions of the opposite coasts that deviate most from the rudimental direction, approach to meridional lines, and consequently to parallelism; these are the coast of Kedah (south of Kwálá Kedáh) and that of Páháng. One of the most re-

markable portions of the coast is the western coast of what we have termed the Lands End of Asia.* Here, for 160 miles from Pulo Lumat to Tánjong Buru in latitude 1° 14' N. (the extreme southern point of the continent of Asia,) its jutting points and indenting bays are disposed along a straight line approaching nearly to S. E. by E. and thus diverging 24° to the eastward of what we have considered the general Peninsular direction.

A slight deviation of 2° E. from this direction (or 149° of the circle) will give the sides of a parallelogram 82 geographical miles in breadth, extending 540 miles throughout its whole length, and including the maximum of land that can be embraced by a regular figure of four sides, or 44,280 square miles. Nothing can better shew the essential regularity of the Peninsular form, and the correctness of the direction indicated, than the fact that the bulging portions on the east and west sides are themselves very elongated, nowhere of greater breadth than 50 miles, while generally much less, and altogether occupy about 17,280 square miles. The surface of the Peninsula is thus about 61,560 square miles. If to this the Isthmus, which has a superficies af about 21,600 miles, be added, the entire area of the Malay Peninsula, in its widest sense, will be about 83,000 square geographical miles.

The western coast of the Peninsula is remarkable for the great number of islets of various sizes which skirt it. A broad and almost uninterrupted belt of these extends along all the western side of the Isthmus, and is continued as far as Pinang, although an interval between it and the Lánkáwí group contains only a few. The rest of the western coast and the greater part of the eastern are more thinly sprinkled with islands. But there are several extensive groups of islands, some of them remarkably bold and imposing, along the latter coast, such as the eastern Johore Archipelago, and the Redang islands. The concave southern coast half embraces the island of Singapore, and an Archipelago of several hundreds of islets stretching to the S. E. by S. from the termination of the continent to Banka and Billiton, marks that the Peninsular zone has not yet wholly sunk be-

* Journal Ind. Arch. Vol. I. p. 211.

neath the sea, and, expanding as it does to the west and blocking the extremity of the Straits, attests how nearly a junction with Sumatra has been accomplished. As it is, Sumatra exercises a large influence on the Peninsula. Stretching along its whole length, and intercepting the waves and the winds of the Indian Ocean, it materially modifies both the climate and the character of the western coast. The broad arm of the sea that lies between them, gradually contracting as the extremity of the Peninsula is approached, and there broken into numerous narrow channels by the Johore Archipelago, acquires a peculiar character, which alone serves to distinguish the coasts between which it is confined, from those of the Peninsula and Sumatra which border the China sea and the Indian Ocean.

The Peninsula does not present much diversity of appearance in different latitudes. Except where the waves of the Bay of Bengal have worn into the ranges of limestone hills, exposing precipitous and caverned cliffs, its coasts exhibit no other variety than what may arise from the different proportions and dispositions of its uniform features,—level alluvium covered with dense, dark green forests,—hills isolated, grouped, or continuously ramified,—and mountains which nowhere attain a remarkable magnitude. If we conceive it divested of the modern alluvial plains and vallies which fringe it, and penetrate between the outer hill ramifications, it will appear as an irregular zone of elevated land, formed of innumerable hillocks and mountains, generally in short ranges and often united into systems, the whole connected mass having a common basis a little above the sea level, but many on the outskirts being isolated. The ancient coast line thus restored will appear very irregular, at some places advancing in successive connected hill ranges with vallies and coves penetrating amongst them, and at others retiring far towards the interior and forming deep bays. Most of the bays, coves and creeks have been subseqently filled up by sediment, producing flat plains and mangrove swamps, through each of which the waters from the surrounding hills wind, collected into streams. The most advancing hill ranges are often seen extending like ribs across the flats, and projecting at the coast or around the margins of the plains.

Although the mediterranean sea that washes the western shores of the Peninsula is the highway between three European colonies planted on it, we remain ignorant of the greater part of its interior. The very facility of exploring it would almost appear to have checked the spirit of adventure. Accessible by every river along a coast of nearly two thousand miles, and intersected in many parts by frequented paths, it yet offers to the spectator from the Malacca Straits the singular phenomenon of a land whose alluvial shores have long been as familiar to us as those of our native country, while of the mountains that rise beyond, the very names, with a few exceptions, have never been heard, and we know them only as we see them, opaque misty protuberances breaking the level of the eastern horizon, and revealing the existence of an inland region wrapped in all the mystery and attractiveness of the unknown. The only authentic description that can be given of the Peninsula must therefore be confined to its exterior. How far our imperfect knowledge of even this, combined with some facts that have been gathered during excursions inland at a few localities, may enable us to form some notion of the general character of the interior will be seen presently.

The western coast of the Isthmus is hilly, much and deeply indented, and acquires a peculiar character from the broad and continuous zone of islands, known as the Mergui Archipelago, to which we have already alluded. Most of the islands are bold, and one of them, St. Matthew, rises to the height of 3,000 feet. The Isthmus itself is occupied by numerous high hill ranges, which have the same general southerly direction. Along the sea borders considerable tracts of flat alluvial land occur, the best known of which is the large plain of Tenasserim.

In the Bay of of Phunga immediately to the north of Junk-ceylon numerous massive rocks rise to heights varying from 200 to 500 feet.

From Junk-ceylon to the Langkáwí group, the coasts of the mainland and islands, still exposed to the full force of the Bengal sea, are broken, and frequently rocky and precipitous. The high and perpendicular limestone rocks, with their deep excavations pillared with colossal stalactites, and with their summits crowned with dense

forest, present the most magnificent scenery. As we proceed south the coast changes, the islands disappear, and on the mainland a broad wooded plain extends from the beach to a considerable distance inland, where mountains are seen stretching away to the southward. The island of Pinang is a bold mountain mass, rising in some of its northerly summits, to a height of nearly 3,000 feet, and contrasting nobly with the broad and beautiful plain which lies opposite to it on the mainland.

In coasting along the Peninsula from Pinang to Cape Rachado, a high chain, or rather series of ranges, of mountains is observed inland nearly the whole way. In front of these ranges we see a broad densely wooded tract of country spread out, often appearing to be perfectly flat and very little above the sea level for many miles together, but from which sometimes low hills rise like islands out of the sea. These hills are frequently quite solitary and at a great distance from the central mountains, or near the coast. Further inland they seem to be generally in groups, and towards the mountains the country, at many places, appears hilly and undulating.

To the south of Cape Rachado the broad plains and high mountain ranges are not recognized. The hill ranges approach to the coast, and generally form it. Where they are interrupted, small alluvial plains are formed, from which narrow vallies penetrate between the ranges. The alluvial formation begins to predominate again on the seabord in the plain of Malacca, which, encircled and intersected by hills that seem to retire in dark undulations to the feet of the Rumbou mountains and the majestic Ophir, and with numerous and various elements of natural beauty and human interest, is the most attractive spot in the Peninsula, presenting a wonderful contrast to the great wildernesses of jungle which spread almost continously both to the north and south of the British Settlement. From Malacca to the extremity of the Peninsula, a few distant and isolated mountain ranges are seen rising over broad alluvial plains, which, at some places, sweep far inland, and near the coast are rarely interrupted in their dead level by hills.

The southern portion of the eastern coast is low and rocky, with long

sandy beaches. As we proceed north, groups of mountains appear at a short distance inland, and alluvial plains in front, as on the west coast. Along the Pahang coast the mountains become more numerous, several ranges appearing behind each other. Considerable portions of the coast are formed by advancing hill ranges, the faces of which, exposed to the attacks of the powerful waves of the China sea during the north east monsoon, are at the points rugged, while the sea in front breaks over ledges and blocks, which shew how the work of destruction has advanced. Where the ranges terminate, considerable alluvial plains, traversed by rivers, occur. Midway between Pahang and Tringanu, and where the Peninsula attains its greatest latitudinal breadth, there is a portion of the coast remarkable for a series of deep bays, separated by bold projecting rocky capes. It seems to be caused by a mountain chain approaching the coast. Of the northern part of the eastern coast we remain ignorant.

Such are the general characteristics of the Peninsula as viewed from the sea. A more particular account of that portion with which we are personally best acquainted will be given, when we speak of the changes which it has undergone from the action of the sea and rivers.

It is impossible to form any estimate of the average height of the interior. The only mountain whose height has been accurately measured is that of Pinang. The summits of which heights have been most carefully ascertained are respectively 2,922 and 2,410* feet above the level of the sea. Gunong Jerái (Kedáh Peak) and Gunong Lédáng (Mount Ophir) have been stated to be 5,705 feet† and 5,693 feet ‡ high, but no dependence can be placed on estimates which have not the foundation of even the rudest barometrical or trigonometrical observations, and which are probably considerably too high.

Geology.—Asia, possessing the greatest, and perhaps also the most ancient, mass of dry land on the globe, cannot be severed, in a physical or geological view, from the great insular region which lies to the southward of it. With reference to the subterranean forces from whose action it rose and took its form, the surface of the ocean indicates

* Belcher. † Low ‡ Newbold.

no real plane of division. A much lower level must be sought as the true geological basis of Asia. To determine the depth and boundaries of this basis, and to distinguish its original limit from that which it acquired in after periods, are problems perhaps beyond even the science of future generations, involving as they do not only facts hidden from all our existing methods of observation, but, in all probability, a series of changes of such a sort that the newer have tended to obliterate the vestiges of the older. But that this basis extends far to the southward of the mass of the continent is demonstrable. In the chain of evidence the Malay Peninsula forms an important link. It is directly united not only geographically but geologically with the continental mass, and, through the islands to the south and Sumatra on the west, a connection with the rest of the Malayan Archipelago can be established.

We have seen that the Peninsula may be considered, when divested of its alluvial fringes, as one continuous belt of mountains and hills separating from the Hindu-Chinese region in latitude 13° 30' N. When we extend our observations to this region we are enabled in some measure to understand the law of its origen. At least certain connections are at once apparent which point directly to such a law. We find that the broad tract, stretching to the eastward over Siam, Kamboja and Cochin China, with which the Peninsular zone is amalgamated, is not an uniform elevated continental mass, in which the Peninsula merges, as the Straits of Malacca lapse in the sea of Bengal. On the contrary, we find that the Peninsular zone of elevation continues uninterruptedly, the only change being that its western border becomes a broad flat sheet of alluvium instead of water, and that beyond this alluvial region another elevated zone occurs, succeeded by a second tract of alluvium, which again is bounded by a third elevated belt. How far to the north these great alluvial plains extend, and how much the northern limit of the Malay Peninsula has been pushed south by the gradual filling up of the northern part of the Gulf of Siam, we have no authentic knowledge. Looking to the size of the Menam, and Mekon or Kamboja river at their mouths, and the great length of their courses, we are prepared

to find this distance very considerable. The Peninsular zone can be traced northward to Thibet in a direction apparently agreeing nearly with the western boundaries of Siam, Anam and the Chinese Province of Yunan. Above this it is not distinctly traceable, as we lose it in that remarkable and little explored tract in which all the Hindu-Chinese zones, many of those of China, and Thibet, and the massive Himalaya themselves, converge, and where, consequently, the ravines of rivers whose estuaries are scattered over a circuit extending from Martaban on the mouth of the Thaleain to Shanghai at that of the Yang-tse-kiang, are compressed into a space not more than 140 miles in breadth.

When we see the approach to parallelism which the mountain zones of the Hindu-Chinese region maintain during a considerable part of their course, and their convergence to one point of the great table land of Asia, we cannot refuse our assent to the geological conclusion that the whole is but an integral portion of the Asiatic mass of elevation, and that these offshoots, thus parallel and adjoining, originated probably in some common cause.

The Peninsular band however can be traced southward as well as northward, beyond the proper geographical limits of the Peninsula. The rocks of the Johore Archipelago and Banka enable us distinctly to follow it through this insular chain.

But there is another and a stronger link between the Peninsula and the volcanic region of the Archipelago. This is the mountain zone of Sumatra, which, while it is parallel to the Peninsula, and repeats its plutonic rocks, is, at the same time, almost united to Java, and, throughout its whole length, contains tracts of volcanic rocks, and volcanoes, several of which are still active.

To complete the chain of evidence, it is only necessary to advert to the fact that the volcanic belt of Sumatra extends at least to Chittagong, thus following the plutonic bands of the Hindu-Chinese region through a large part of their course to the north.

Enough probably has been said to indicate how intimately the Peninsula is connected with the great Asiatic mass on the one hand, and the Archipelago on the other. It would too much extend this paper

to pursue the subject further than suffices to satisfy the reader that, as we cannot arrive at the ultimate geological theory of the Peninsula without considering the whole vast region of elevation in which it is situated, so the geological facts which the Peninsula, considered in itself, presents, must possess an interest for all who are labouring to elucidate the theory of the elevation of any other part of that region. *

* "That the movements which elevated the mountains of the Malayan Peninsula had an intimate relation with those that elevated the mountains of Sumatra, seems evident, whether we regard the hypothesis of De Beaumont, the more recent observations and theories of Mr. Darwin, or the mechanical researches of Mr. Hopkins. Both form long chains which pursue parallel lines not more than 3 or 4 degrees distant. But we must probably take in a much wider geographical range if we would seek a general geological theory of the region which they traverse. The mountain chains of the Peninsula of India are parallel, or approximately so, to the Malayan, and like them, spring from the great central system of Asia. The chain of the Peninsula of Malaya is directly continued to this region, and from it descend nearly parallel chains through Burmah, Siam and Cochin China. These ranges determine the general direction of the sea coasts, wherever these are exposed to waves sufficiently strong to prevent the formation and extension of great alluvial plains. The western coasts of India and of the Tenasserim Provinces, Siam, the gulf of Siam and the eastern coast of Cochin China are thus fixed. A wide and interesting field of iniquiry is opened up by the probable geological connection between the regions of these ranges and those of the Indian Archipelago generally, Australia and the Archipelagoes of the Pacific, evidenced by the prevalence of parallel lines of elevation, and perhaps also by organic remains, such as the fossil elephant and some of the carboniferous plants of New South Wales. The former existence of a great Australasian continent, an extension probably of the present continent of Asia, which seems to derive support from Mr. Darwin's theory of Atolls, would be an inference in accordance with these facts, although we must either exclude the greater part of the Indian Archipelago from the speculation, or, to bring this tract within it, suppose its existing elevation to have succeeded to an era of subsidence. But, putting aside this speculation, and viewing the whole region, interspersed with peninsulas and islands, from the Indian Ocean to the heart of the Pacific, as one, it might appear that if we slightly modify De Beaumont's theory of parallel rectilinear or oblong areas of elevation and subsidence, which Mr. Darwin has applied to the eastern tracts, and conceive curvilinear lines or systems of parallel, or slighly divergent, curvilinear lines proceeding from centres and often meeting similar lines or systems from other centres, and, again, lateral and secondary lines diverging from the principal, the arrangement of the observed ranges would assume greater symmetry, and be found, perhaps, to accord with the hypothesis that *one* widely extended and slowly increasing mechanical pulsion, or tension, accompanied by local foci and tracts of intense development, from weakness in the rocks or increased plutonic or volcanic action, gave the first direction to all the main lines of elevation. Thus let us conceive such a centre to be situated in the western half of New Guinea, and we have some independent warrant for doing so, in the circumstance that the mountains of its unexplored interior appear to attain a magnitude unusual in the Archipelago. From this focus we may trace one great curvilinear fracture or band of rupture of the earth's crust through the Sunda Islands to Chittagong; a second

That the fundamental geological connection of the Peninsula with the continental and insular regions which it unites, is not evidenced by mere parallelism of elevation, will appear in the sequel.

through the mountainous volcanic islands of Ceram and Bouro, and along the southern coasts of Celebes and Borneo (Gunong Ratos), Billiton, Banka, the Malay Peninsula, &c.; a third through the Phillipines, Formosa, Japan, &c.; a fourth along the southern coast of New Guinea, and through the Solomon Islands, New Hebrides, New Zealand, &c.; a fifth along the southern coast of New Guinea, across Torres Straits and along the eastern coast of Australia, and a sixth perhaps through the north-western division of Australia. Other principal lines probably proceed across the Moluccas and Celebes, through Borneo and the islands of the China sea (now a subsiding tract*), and join the mountain chains of Cochin China and Siam, but the geography of Borneo is not sufficiently known to allow of our positively ranking these as seventh and eighth lines. The intermediate areas may be occupied by numerous other lines, but the subsidence of various tracts must render it difficult or impossible, particularly to the eastward, to trace the original courses of vertical movement until the soundings of the Polynesian seas are ascertained. Subsequent shifting subterranean action would cause many other fractures in various directions, but it would not, at least until the lapse of a long geological epoch, obliterate the primary lines. It would often cause cross fractures, of which many instances might be pointed out. It is no objection to this hypothesis that many of the lines seem to proceed from the central table-land of Asia. Because if at the time these fissures were being extended southward, a great local action took place at or near New Guinea, they would, according to the mechanical laws examined by Mr. Hopkins, diverge from their original direction towards that point, or to meet the lines radiating from it. Thus we observe the two least broken lines to pursue a southerly direction till they reach the parallel of 8° N. L., when, at the Nicobars† in the one, and at Junk-ceylon in the other, they are deflected to the S. E. When they cross the meridian of 106° E. they make a more decided bend to the eastward. If we follow these lines and the chains of Siam und Cochin China northward we may trace them upwards to the Bayan Khara mountains, and thence to the vast central mass of Kulkun, from whence great ranges are said to proceed towards all the points of the compass. But in the north-western part of the province of Yunnan, and north-east of Burmah and Assam, their continuity is interrupted, and we seem to have ascertained another central region, whence radiate not only the lines which afterwards converge to New Guinea, but various other curvilinear ranges proceeding S. E., E., N. E. and N. through China, and N. and N. W. through Thibet, and, lastly, the Himalayas and a minor range proceeding south-eastward on the south of the valley of Assam, and continued, perhaps, in the Vindyas,—for a subsequent line of subsidence passing down the plain of the Ganges and through the Bay of Bengal, of which there is some evidence, may have destroyed the pre-existing continuity. Many of these ranges proceed primarily from the Kulkun, but it is remarkable that they converge towards the region indicated. The region where the Himalayas attain their sublimest proportions, and give birth to rivers that embrace them, and all India, in their courses, is another grand focus. From this centre the range proceeds on the one side to the eastward, and on the

* Query

† [The Nicobars are excluded by Von Buch and Lyell from this great volcanic zone, but the earthquakes of October and November last have shewn that they form an integral part of it.]

Sedimentary Rocks.— Before proceeding to consider more closely the evidences of elevation, and the phenomena to which it has given rise, let us enquire ofwhat rocks the Peninsular tract was composed before it was broken up in the progress of the great Asiatic upheaval. We believe that when the Peninsula has been thoroughly explored it will not be difficult to picture it as restored to its previous condition, because, although the interior has been generally considered as composed of rocks of upheaval, we be lieve, from what we have seen of it, that the upheaved rocks will probably be found intermixed with them in sufficient abundance to enable a practised geologist to supply the lacunæ. At present our information is so exceedingly limited that we can only give a very general account of the sedimentary rocks in different latitudes.*

Along the western coast, from Junk-ceylon nearly to Pinang, limestone appears to be the predominating stratified rock. It is accom-

other to the N. W. To the north of the former, a secondary aud approximately parallel range also proceeds eastward, and includes with it the valley of the Sanpao, and, to the south, another and smaller secondary parallel range traverses upper India. To determine the original centres of maximum intensity and directions of the forces that elevated the great connected mountain system that forms the skeleton of the Asiatic continent, is a problem beyond the present reach of geology. But there can be little doubt that an extensive knowledge of the physical and mineralogical constitution of mountain ranges will form the true basis of the highest department of the science, now only dawning,—the Mechanism of the Earth." From a paper by the Writer *On the Local and Relative Geology of Singapore, including notices of Sumatra, the Malay Peninsula &c.* presented to the *Asiatic Soc. Beng. January 1846* (slightly altered.)

In citing the above speculation we need hardly remark that we do not claim for it any consideration geologically. But we are far from thinking it useless thus to turn aside occasionally from the actual observation of local facts (the only basis of solid induction) and cast a glance over the disposition of the other elevated chains of rock which constitute Eastern Asia, peninsular and insular. That a real geological analogy will always be found at the bottom of the superficial and apparent analogies of continental structure is not to be imagined, but enough has been observed in the Peninsula, Arracan, Southern India, &c., to encourage an expectation that many fundamental relations binding the region together will be ascertained as we extend our knowledge over the great geological terra incognita around us. These apparently systematic, and at least symmetrical, distributions of land, most of which can only, as yet, be connected with geography, may be allowed to attract the attention and give a zest to the labours of the geological enquirer. Hypotheses which cannot disturb, may be suffered to incite, research.

* The geology of the Isthmus of Krá has been partially described by Dr. Helfer, but as we have not his report to refer to we exclude the Isthmus from the observations which follow.

panied by sandstone and clays, and the latter rocks probably gain upon it in bulk as its southern boundary is approached.

Last year indications of coal were found on the coast to the south of Junk-ceylon, and a partial examination on different occasions during the year resulted in the discovery of coal at Támá, Tánjong Bombong and T. Pátong, of which the most northerly is in lat. 8° N. and the most southerly in 7° 37' N.* Traces were also observed about one degree farther south. It has not yet been found in layers sufficiently thick and pure to be wrought, being generally lapidified or pyritous. But, where pure, it is a highly bituminous jet, and superior to the products of the Indian coal fields. The existence of coal in the calcareous division of the Peninsula serves to shew that its geological features were analogous to, or identical with, those of the Isthmus of Krá, before the era of the plutonic elevation of the zone.

We believe that the limestone has not been observed further south in the Peninsula than the Bunting Islands, which lie a few leagues to the north of Pinang. Opposite Pinang, and for some distance to the northward, sandstone appears to be the principal aqueous rock. It is associated with clays and shales. A similar formation probably existed and is still partially preserved, in Perak, but we have no account of the sedimentary rocks of that country, nor of the northern part of the next kingdom, Sálángor. Of the southern part of Sálángor and of Johore generally we can speak more positively from personal observations. The predominating sedimentary rocks in the last two degrees of the Peninsula are argillo-micaceous and argillaceous schists, with which sandstones and common clays and shales of various colours are associated. The sandstones and common clays and shales in some places predominate, as in Singapore, and some of the middle parts of Johore. The same rocks are found in the northern islands of the Johore Archipelago, but we are without any actual observations of the larger portion of this Archipelago. In Banka the prevailing stratified rocks are clays and sandstones.

* Journ. Ind. Arch. &c. vol. i. p. p. 115, 151, 353.

Plutonic Rocks.—Throughout the whole length of the Peninsula plutonic rocks have swollen up, and they are so abundant that authors have described the interior of the country as presenting a continuous range of "primitive" mountains. Our own observations do not lead to the conclusion that the Peninsula can be considered as a great longitudinal plutonic ridge, with the purely sedimentary rocks regularly disposed in strata on the two sides, those on the west dipping away from it in that direction, and those on the east in the opposite direction. On the contrary, a multitude of phenomena satisfy us that the sedimentary rocks themselves have everywhere, in a greater or less degree, been subjected to direct plutonic influence in a manner that has not hitherto been noticed. The mode in which the granitic and allied rocks occur at a distance from the central ranges might of itself suggest the true theory of the region.

It appears to us that the Peninsula, in its whole breadth, is one of the bands of more intense action in a great region which has been subjected to plutonic intumescence. The mountainous central tracts indicate that the intumescence was in general greatest there; but the irregularity with which the granitic ranges occur, their distance from the middle of the zone in many cases, the occurence of plutonic patches on the outskirts of the zone amongst the sedimentary rocks, and of the latter in the more central tracts, finally, the fact of bold plutonic mountains abruptly appearing at the very edge of the zone and even beyond it, such as Pinang, the Karimons, Pulo Tioman, &c. are inconsistent with the simple theory of a plutonic ridge rising in the centre of the Peninsula like a long wedge, and raising the strata on either side.

The general uniformity in the direction of the Peninsula proves that the subterranean intumescence itself, in its greatest force, had the same uniformity of direction. It has swollen up in a zone, approaching, in its horizontal section, nearly to a very elongated parallelogram, having the direction of S. E. by E.

While expanding it must therefore have produced a great tension in a transverse direction, and whether, in the result, the crust had given way in one great rent down the middle of the zone, or in a multi-

titude of scattered rents, the rupture would be across the direction of tension, or parallel to the sides of the zone. It is not to be supposed that in nature anything so simple as an intumescence uniform in length and breadth could occur, and the irregularities in the boundaries of the zone, and in the direction of the tension in different latitudes must have been considerable. Nevertheless we find that the evidences of the mode of action preserved in the remaining sedimentary rocks corroborate, in the most striking manner, the deductions that might have been made from a theory based simply on the general direction of the zone. The broken edges of the uplifted strata exhibit in their strike, wherever they have been examined, a near approximation to the direction of the zone. Ranges of plutonic and sedimentary rocks and the vallies between them, in most cases, pursue a similar direction. Having ascertained this to be the case on the eastern and western coasts of Johore, Pahang and Sálángor, and having minutely verified it over nearly the whole of Singapore and the adjacent islands, we are justified in concluding that the same facts will be found repeated throughout the rest of the Peninsula, where we know that the leading plutonic phenomena are, in other respects, similar to those of the southern region. Here we are everywhere reminded of the mode in which the Peninsula rose. If the strata are not visible, we may often trace the Peninsular direction in the junction between the greyish, yellowish or light reddish sandy soils and the strongly marked reddish and light chocolate clays. And where these well contrasted colours are wanting, the general ranges of the principal vallies, and hilly ridges, furnish a similar indication. Even the fissures in the protruding granitic blocks tell the same history.

But the plutonic intumescence has left other evidences besides ruptured and upraised strata, of its presence beneath those parts of the zone where it has not reached the present surface. Even at a distance of many miles from the nearest visible plutonic rocks, the exhalations from the subjacent intumescent mass have risen into the strata in innumerable ramifying walls, veins, and irregular patches, producing the various forms of siliceous, and ferro-siliceous, laterite

and other ironmasked* rocks, which constitute the most characteristic features, and the chief interest, of the sedimentary rocks of the southern part of the Peninsula.†

In other cases the plutonic action has indurated the superincumbent strata, converting sandstones into compact siliceous rocks, and clays and conglomerates into chert and other hard crystalline forms.

The appearance of the ironmasked and ironribbed strata in ridges and branched ranges, dipping sometimes towards the S. W. and sometimes towards the N. E., generally at high angles, often vertical or nearly so, occasionally horizontal, or moderately inclined, and with all these variations occurring in limited localities, impresses the spec-

* "The interest which the discussions respecting laterite have given to that rock, tends to invest it with undue importance geologically. The ferruginous emissions have affected all rocks indiscriminately, and their action on sandstones, grits and conglomerates is as well marked as that on clays, marls and shales, although the latter only produces proper laterite. Even in the clays, laterite denotes one only of many degrees and forms of alteration. To express the origin of these rocks, and its unity, to record the cause of the difficulties which they have presented, and to distinguish them from true metamorphic rocks, I would propose, avoiding any new technical names, to term them simply the *ironmasked* rocks of the Indo-Australian regions. This term will include the principal or plutonically ferruginated rocks, which, without being either completely reduced or metamorphosed, have been either wholly disguised or partially altered by ferruginous emissions, which have saturated them in the mass,—or only affected them in fissures and seams,—or been interfused between portions of the rocks not actually separated by fissures, but intersected by planes of mere discontinuity, the sides of which have an imperfect cohesion, or having a common border of inferior density and increased porosity, caused either by interruptions in the original deposition of the matter of the rock, or by unequal stretching, or incipient cleavage. The term may be also extended, perhaps, to those sedimentary beds in which the iron saturation, although coeval with the deposit of the other constituents of the rock, has served to obscure or conceal their true nature as well as the derivation of the beds themselves. These beds appear to have been sometimes formed by superficial layers of gravel, &c. being permeated by iron solutions. With these must not be confounded the broad-bands lying over and beside the heads of ironmasked dykes, and which, having been in a loose gravelly or fragmentary state at the time when the plutonic emissions passed through them, became cemented into hard, and occasionally scoreous, ferruginated conglomerates &c. and are therefor proper plutonically ironmasked rocks." Introduction to paper *On the Local and Relative Geology of Singapore &c.* (cited *ante* p. 92.) [March, 1847.]

† The igneous rocks of the Peninsula, viewed by themselves in particular localities, prove that a difference of pressure is not essential to the contemporaneous production of plutonic and volcanic types, and the general plutonic phenomena of the zone further seem to us to shew that granite bubbles may swell to *the surface* of the sedimentary rocks,—which they assimilate and absorb while they raise. The greater part of the sedimentary crust of the Peninsula has not, according to our view, been removed by denudation.

tator with the belief that they are remnants, often mere patches, of the former stratified crust of the Peninsular zone, scattered irregu-

It still exists converted into plutonic and volcanic rock. Of such conversion there is much evidence both positive and circumstantial. Of denudation adequate to explain the phenomena there is none. We have not thought it advisable to introduce into the text of a paper like the present an assertion of a view which many geologists may consider inconsistent with theories which they maintain. But we subjoin two general statements of it from the introduction and appendix to the paper before cited, premising that the present paper will be followed, when room can be made for them, by descriptions of the rocks of Malacca, Singapore and the kingdom of Johore generally, which will place before geological readers many of the facts on which this view is based.

"The disturbed sedimentary rocks were re-examined free from the bias of that theory,* and it then appeared, that, while the evidence in favour of the metamorphic origin of the laterites, &c., was so strong and varied that it might be now recorded as a demonstrated fact; there were no apparent obstacles to the reception of the simple hypothesis that they were caused by plutonic agency, and that the plutonic rocks of the districts were themselves the agents of the alteration, or the effects of one and the same hypogene agency. This hypothesis embraces at once the whole region of elevation in which Singapore is situated, with all the plutonic, volcanic and metamorphic phenomena which it exhibits. It refers the whole to one cause operating throughout a long period of time, and which has not yet entirely ceased to operate, as the volcanic emissions of Sumatra and the vibrations of the whole region, from time to time, and the thermal springs of Sumatra and the Peninsula, constantly, testify to us. This cause is the existence of an internal plutonic intumescence, or nucleus, which has slowly swollen up, fracturing the sedimentary strata, saturating and seaming them with its exhalations, and as it forced itself up beneath them and through the gorges and fissures, at once upheaving them and feeding on their substance, till, in many places, it pressed and eat through them to the refrigerating surface, and rose, congealing, into the air or sea. It is this latter circumstance that distinguishes the region from all those which have been observed by European geologists, and it is this singularly high level which the plutonic reduction has reached that explains the extraordinary appearances which the unreduced superficial rocks have so often assumed. The metamorphosed rocks of Europe evinced a deep subterranean saturation with plutonic exhalations, and European geologists concluded that plutonic action was necessarily deeply subterraneous. But here, I think, we find a subaerial or subaqueous plutonic activity; and, where the plutonic level has not reached that of the pre-existing rocks, a new kind of metamorphism appropriate to the new conditions under which the plutonic exhalations have operated."

"The whole region has been subjected to plutonic reduction. The plutonic fluid by its pressure has caused fractures in approximative N. W... S. E. lines, and it has swollen up in ramifying bands having that general direction. Its pressure and heat have varied at different portions of its surface. In some places the heat has been so intense as to reduce all the superincumbent rock up to the very surface into its own substance, and it has swollen up in mountains in the interior and hills in the exterior lateritic tracts of the Peninsula. The transformed and partially transformed sedimentary hill ranges rest,

* The theory that granites &c. can only be produced at deeply subterranean levels, and under vast pressure. Throughout this paper in using the word plutonic, we merely intend that the producing forces, and the rocks produced, originated from beneath.

larly over the surface of a continuous plutonic intumescence. We have alluded to the fact of protuberances of the plutonic nucleus appearing on the outskirts of the zone, and mentioned several instances of their rising to a great height. But in the low undulating country between the great alluvial vallies, between the flat seabord and the mountainous interior, and between some of the mountain ranges themselves,—which is composed, for the most part, of ranges and systems of ranges of hills, seldom rising beyond a few hundred feet in height, and often, in considerable tracts, not attaining the height of one hundred feet,—we find the hills frequently plutonic. Between Junk-ceylon and Pinang, granite appears frequently along the coast and in the islets. On the mainland opposite Pinang it rises in low hills at a short distance from sedimentary rocks. As we proceed southward we find it in the Dinding islands. Of the coast from thence to the southern part of Sálángor we have no geological account. In the remainder of the coast, it appears forming the anterior part of the hilly country extending back from the coast between Tánjong Budéwá and Tánjong Pánchur. It rises again beyond the Town of Malacca in the hills of the Water Islands. At the mouth of the Bátu Páhát or Rio Formosa plutonic hills appear. When a transverse section of the Peninsular zone of elevation is afforded by the Straits of Singapore, in a latitude where the mountains have disappeared, we observe that from one-half to two thirds of the system of low hill ranges which form the island of Singapore are plutonic.

I conceive, upon granitic bubbles * where the plutonic action has been less intense. The fissures and cracks formed by the pressure of these bubbles have been the channels, the gases given off from their surface the immediate agents, of all the alterations. The tracts where only granite now appears swelling above the surface had previously passed through the same stages. In other words, laterite is one of the earliest stages in the reduction of the upper rocks superincumbent on a plutonic sea into the substance of which that sea is composed. Where the heat has been least intense, the upper rocks have merely been raised,—where greater, lateritic, scoreous, and other partially altered, hill ranges, have been produced. A higher degree of plutonic action has produced quartzo-ferruginous ranges like that of Cape Rachado. The highest degree has transformed or reduced the whole into granite and allied crystalline rocks"

* I do not mean that each boss or hill range has a corresponding protuberance on the surface of the plutonic base, but that the whole system of hills and hillocks has been produced by inequalities in that surface, and by the directions which the principal and divergent lines of fracture have taken

When we ascend the valley of the Johore river, which gives a partial longitunal section, the same phenomena are presented. We first meet with sedimentary rocks, in some places very highly ironmasked. Then low granitic bosses are seen extending over a considerable tract. Higher up aqueous strata recur, and then granite appears again.

In a zone of such length the plutonic rocks might be expected to vary greatly. But in fact this variation takes place within very narrow limits. In the short range of Pinang, for instance, the granite changes its character as we proceed from north to south, having at first a great predominance of quartz and felspar with a general coarseness and uniformity of granulation, and then losing this uniformity, assuming a larger proportion of mica, acquiring in many places hornblende and schorl, varying in composition, and, in texture, becoming, in some bosses, as fine as fine grained sandstone. In much smaller ranges at the southern extremity of the Peninsula, the rock may be seen changing from highly crystalline and large grained granite and syenite through greenstone to types almost purely felspathic.

Porphyries, claystones, and other rocks of the volcanic class also occur adjacent to granites, and are evidently contemporaneous with them. Very well developed large grained granite appears in the low hills, entirely composing them, or forming patches in tracts approaching to volcanic types; but several instances which we have observed seem to indicate that in the bulky mountain masses the rock is generally more uniform and highly crystalline than in the smaller bosses, whether these occur in immediate contact with the mountain flanks or at a distance from them in apparent isolation amongst sedimentary rocks.

The granites of the southern part of the Peninsula are generally hornblendic, and often to such a degree that the soils which they yield are of a dark red hue.

The structure of the plutonic rocks of Johore is sometimes as remarkable as their rapid graduation from plutonic to volcanic types. Well crystallized ternary and quaternary granites exhibit an unequivocal laminar arrangement, the laminæ being spherical, cuboidal,

rectilinear, and in irregular variously curved planes. The partial decomposition of such rocks has produced, in the masses that are left protruding, the most singular and imposing forms. Amidst the luxuriant forest that always covers granitic hills and mountains, the explorer suddenly finds himself facing a high perpendicular wall of rock, indented by numerous vertical grooves sometimes 5 or 6 feet in depth. Very fine and varied examples of these occur on the island of Pulo Ubin near the south east angle of Singapore. We have observed them also on Gunong Tunyo Laut, in the north east of Johore, and, in a less regular form, at other places.

In concluding this brief notice of the plutonic rocks we may advert to the existence of several thermal springs in the interior of Malacca as affording an evidence that, at subterranean levels, the intumescence which produced the Peninsula has not yet parted with its heat. This, combined with some proofs of recent upheaval, that will be mentioned afterwards, leads to the surmise that it still retains the character of a rising region: a surmise which its proximity to Sumatra countenances.

Metals.—The tendency to the production of metalliferous ores at and near the junction of plutonic and sedimentary rocks which has been observed in many countries, might have led us to anticipate a large share of metallic riches for the Peninsula. In reality it probably abounds in some ores far beyond conception.

Iron ores are every where found, and in the south they exist in vast profusion. In some places the strata have been completely saturated with iron, and here the bare surface of the ground, strewed with blackish scoriform gravel and blocks, presents a strange contrast to the exuberant vegetation of surrounding tracts, appearing as if it had been burned and blasted by subterranean fires. Much of the ordinary forms of ironmasked rocks, which are so common and so little regarded for their metallic contents that in Singapore they are used to macadamize the roads, contain often nearly 60 per cent of pure metal.

The whole length and breadth of the Peninsula there can be little doubt [illegible] Tin ore. The uniformity, we might almost say uni-

ty, of its plutonic character, warrants the inference that ores found plentifully in many different and distant localities where they have been sought for, exist also in the intermediate tracts which have not yet been examined. At the two extremities of the Peninsular zone of elevation, Junk-ceylon and Banka, tin sand is diffused in such quantity that its collection has never had any other limit than the number of persons employed in it. In Junk-ceylon and Phunga, under a barbarous government, about 13,000 piculs are annually dug out of the soil. In Banka, under a European government, but without any improvement on the usual Chinese modes of excavating, washing and smelting, the production has increased from 25,000 piculs in 1812, when it was a British possession, to 60,000 piculs.*

At numerous intermediate localities throughout the Peninsula tin is obtained; and when we consider the despotic, rapacious and too often remorseless character of the native governments, the consequent failure of all attempts to introduce European or Chinese capital and system into the tin mining, and the robberies and massacres which from time to time terrify and scatter the little communities of needy Chinese in whose hands it has remained, the wonder is that so much metal should find its way to the market. In the Siamese countries north of Kedah and in Kedah itself, which has been so long in a state of anarchy, it is sparingly extracted. From Perak 9,000 piculs per annum were formerly exported, but the produce has now greatly diminished owing to the miserable state of the country. Sálángor and the adjacent inland states yield about 9,000 piculs. The eastern countries from Kalantan to Pahang yield about 11,000 piculs. The present produce of the whole Peninsula including Sinkep and Linga, the only two islands of the Johore Archipelago where it is now sought for, is probably above 40,000 piculs. The produce for many years past has ranged between that quantity and 30,000. The Peninsular range, therefore, including Banka, yields upwards of 100,000 piculs, so that it equals or exceeds that of Cornwall (6,000 tons) and may be expected to increase steadily.

Seeing that tin is procured in all parts of the Peninsula where it is

* Dr. Epp, *Schilderingen aus Ostindiens Archipel p. 183.*

sought for, and in proportion to the enterprize and labour which are devoted to the search, we may consider the entire zone as a great magazine of tin. It is, in fact, incomparably the greatest on the globe. Johore might have seemed to offer an exception to the apparent universality of the distribution of oxide of tin, if its geological affinity to Banka, the fact of tin having from time to time been found in several places, and for many years having been got in considerable quantity in Malacca, had not afforded the strongest presumption that its want of inhabitants and government was the cause of its nonproductiveness. The last eighteen months however have placed the matter beyond doubt, and given a striking proof at once of the metallic fertility of the country, and of the little attention which this branch of industry has hitherto met with in the British Settlements. In 1845 Malacca, an integral part of Johore and having the same geology as the rest of the country, produced about 450 piculs of tin. In the succeeding year the interest of some Chinese of capital was excited in the subject, and more vigorous and extensive operations were commenced. In 1846 above 1,400 peculs were procured, the greater part from 39 pits in one valley. In 1847 the produce appears to have been from 4,000 to 5,000 piculs. In 1848 it will probably rise to between 5,000 and 7,000 piculs, for the government tithe upon it for the year has been rented for the unprecedented sum of 8,190 Sp. Dollars, the revenue from this source having been in the two preceding years $ 1,020 and $ 3,345 respectively.

Nothing can better shew how entirely the metalliferous character of the Peninsula has escaped the mining enterprize of private European capitalists than the fact that in the island of Singapore, where we have a line of junction between plutonic and sedimentary rocks of above twenty miles in length, where tin was found in former years in at least two localities, and where the same iron ore with which it is associated in Banka abounds both in the igneous and aqueous rocks, no interest has ever been awakened in the subject.

In the Peninsula and Banka, tin has hitherto been procured by digging pits in alluvial tracts where the ore is found, generally intermixed with quartz particles, in a state resembling sand varying from

fine to coarse.* We have large specimens with the ore adhering to and partially invested with quartz. We are not aware that it has ever been actually seen in the solid rock in the Peninsula, but in Banka it is found associated with iron ore in veins in the granite. A Dutch writer also describes whole layers as occurring in some mountains which consist partly of granite, but in the centre principally

* In most cases it appears to be properly *stream ore* i. e. the fragments and particles of disintegrated rock that have been born to lower levels by rain torrents and streams. We think however that there are both tin and gold pits in which the rock has been decomposed and disintegrated in situ, and a careful examination would probably prove that there are many such. The clays in our Peninsular vallies are not always alluvial, and in the higher part appear most often to mark the decomposition of the subjacent rock. In a recent excellent geological work by Professor Ansted (*Geology, Introductory, Descriptive and Practical* vol ii. p. 281) it is erroneously stated that in Banka the ores of tin are entirely obtained by sifting the gravel and sand of rivers. In Banka and the Peninsula the beds of streams are seldom resorted to, save to obtain indications of the probable abundance of "*tin sand*" in the vicinity. One of the narrow vallies between the parallel ranges or branches of the low hills is selected, and, if tin be found, pits from 10 to 60 feet in depth are dug, and carried regularly up the valley, a new one being opened as soon as the last is exhausted. In this way the entire breadth of a valley is sometimes excavated by successive pits throughout a length of two or three miles, if the tin sand be found continuous.

In Malacca the tin sand is generally found at the bottom of a series of alluvial layers. This is also the case in Cornwall, where it appears to be attributed to diluvial action. In the Malacca vallies there is no evidence of diluvial action. The accumulation of the tin ore in the bottom of the valley may be explained, in some cases, by the decomposition of the rock and washing away of the clayey and lighter siliceous particles,—the tin ore and associated quartz remaining by their gravity. In other cases it may probably be explained by the consideration that in the earliest ages of the vallies the disintegration must have been more rapid and the fall of the vallies greater. The torrents in rains would have a considerable impetus, and carry forward the disintegrated fragments of the rugged and naked ravines. In the course of time these would be smoothed into gentle slopes covered with vegetation, and the slopes of the bottoms of the vallies would gradually decrease as their mouths became choked with mud flats and sand banks, and the alluvial deposit spread back, raising the level of the vallies.

We have dwelt at some length on Tin because it is the principal natural production of the Peninsula, which derives from the fact of its being the greatest stanniferous tract in the world an importance economically which has never been sufficiently appreciated. We are able to state confidently that the geological conditions which seem to be necessary for the production of tin in this part of the world are found in the Peninsula as fully developed as in Banka. Both portions of the zone have been equally affected by, and have indeed originated in, one and the same igneous action, of which one of the phenomena has been the formation of tin ore. The existence of tin in Banka was unknown until 1709 when it was accidentally discovered. Now, its produce doubles that of the Peninsula, although the latter has a surface 18 times larger. The reason is not a mineralogical one. It is because in Banka the Chinese are stimulated, furthered and protected by a strong Government, which directly interests itself in their operations.

of layers of sandstone and quartz in which iron ore also appears. In the more purely granitic mountains it seems to have been observed in quartz at the junction of the granite with the iron veined sandstone strata. In the Isthmus of Krá it has also been found at the junction of sandstone and granite. In Cornwall it appears to be dependent on granite.†

The finest ore of Banka yields as much as 80 per cent of metal, the common sorts from 40 to 60. The quality of the Peninsular ores has not been ascertained so carefully. We are not aware that more than 70 per cent has ever been obtained.

Gold is found in the Peninsula, but, whether from inferiority of enterprize or natural deficiency, not in such abundance as in those parts of the adjacent countries of Sumatra and Borneo where it is systematically dug for. The present annual produce is probably about 20,000 ounces. In all the larger specimens which we possess or have seen it is disseminated in small particles, and streaks in quartz. Like the tin ore it has not been seen in the undisintegrated rock.

Copper, silver and arsenic have been detected in Banka, but apparently in small quantities.

Climate.—Before inspecting the shores of the Peninsula more closely, it is necessary to advert to the peculiarities in climate which affect the watery agencies to which they are subject, and all the observations that appear necessary on the climate may be here introduced together.

The mean temperature of the Peninsula is probably about 80° at the level of the sea. In its general humidity it also approaches to uniformity, but dry and rainy weather are more distinctly separated in the northern countries than in the southern. The latter are not subject to the occasional violent rains and prolonged droughts which visit the former, and the former are not exposed to the frequent tracts of damp, foggy, rainy weather which are experienced in the latter.

During the N. E. monsoon, which ordinarily blows from Novem-

† "Granite or its modification, elvan, occurs near, or at, all the localities where tin and copper ores so abound as to be worked and produce good mines." De la Beche.

ber to March, the weather is generally settled in the Straits of Malacca, and N. and N. E. winds prevail, particularly on the coast of the Peninsula, but are not of great strength save towards the northern end of the Straits. Breezes usually blow from the Peninsular shore at night. The equable character of this season is attributable to the monsoon being broken by the mountains of the Peninsula, which stretch transversely to its direction. The exposed east coast of the Peninsula, on the other hand, experiences the full force of this monsoon. The intercourse between the Malays of Singapore and those of Pahang, and other places on that coast, in small boats, which is constant during the S. W. monsoon, is now interrupted, and a land route occasionally substituted. Rains are frequent and heavy, and the southern extremity of the Peninsula, including Singapore, in some measure partakes of the same climate, for the ranges of hills separating the valley of the Johore river from the China sea are too low to give effectual protection.

The S. W. monsoon, which prevails from April to October, blows against the northern part of the west coast of the Peninsula, which consequently, in some measure, participates in the rainy climate which characterises the eastern shore of the Bay of Bengal during this monsoon. Further south, is is broken by the mountain belt of Sumatra, so that, in the Straits, land and sea breezes generally prevail in the vicinity of the coasts, and an equable climate is experienced. The Sumatra side of the Straits, and the southern portion of the Peninsular, at night are exposed to occasional sudden squalls from the S. W. accompanied by lightning and heavy rain, called *Sumatras*. *North westers* are also experienced, but more rarely. They occur chiefly in the northern part of the Straits as far as the Arroas, but sometimes blow right through them to the Carimons. During this monsoon the east coast of the Peninsula, having a leeward exposure, and being, for the greater part of its length, protected by the double wall of the Sumatran and Peninsular ranges, is perfectly sheltered, and dry weather prevails.

The remarks in the two preceding paragraphs are chiefly derived from Horsburgh, and based on the experience of nautical men. More

exact climatic observations have, at different times, been made at Pinang, Malacca and Singapore. By far the most complete and accurate of these are Captain Elliot's at the Magnetic Observatory in Singapore. Unfortunately, owing to Captain Elliot's absence, and the want of access to any connected record of his observations, we must depend, for the present, on more imperfect registers.

Assuming the climate of Pinang to represent that of a considerable portion of the northern part of the Peninsula, it appears from tables given in Dr. Ward's work that the mean annual temperature, at an elevation of 2,410 feet is about $70\frac{1}{2}°$, the mean annual range $10\frac{1}{3}°$, the average greatest daily range 9° and of the least daily range $1\frac{1}{5}°$.* On the plain

the mean annual temperature is.....	$79\frac{2}{3}°$
Id. of the morning about sun rise	$75\frac{2}{3}°$
Id. of daily maximum temp... ..	$88\frac{3}{5}°$
Id. evening after sunset	80°
Annual range from	$70\frac{1}{2}°$ to $90\frac{1}{2}°$
Average monthly range	11°
greatest daily range	13°
average *id.*	6°

In general neither rainy nor dry weather is in excess, but exceptions occur at intervals of a few years. Dr Ward found that the average number of rainy days for four years was 182, the greatest number in one year being 209 and the least 160. Colonel Low informs us that rain fell almost every day betwixt October 1789 and June 1790. "Betwixt May 1833 and April 1834 rain fell on 145 days on the Pinang plain, 166 days on the Flag Staff hill, and 228 days in Province Wellesley, and the quantity at each station was

	in.
on Flag Staff hill	$116\frac{6}{10}$
Pinang Plain	$65\frac{5}{10}$
Pr. Wellesley	$79\frac{1}{10}$.

"The influence of both monsoons is felt at Pinang. In the early part of March the weather is generally clear; towards the end, how-

* Dr. Ward's Contributions to the medical topography of Pinang p. 6.

ever, monsoon weather prevails. In the two succeeding months, especially in May, frequent showers occur, but the falls of rain are seldom heavy. June is rainy; squalls from the westward are frequent, and sometimes violent. In July, August and September, the sky is generally overcast; much rain falls alternated with sunshine; squalls are also frequent in the two first, accompanied with electrical phenomena. The early part of October is generally clear and pleasant; towards the end of the month however the influence of the N. E. monsoon is perceived; squalls from the N. occur; dense masses of clouds collect; and rain falls in great quantity for days uninterruptedly, attended with much thunder and lightning. November and December are pleasant, cool, delightful months; the morning breeze is refreshingly bracing; the heat is moderated by frequent showers and occasional heavy falls of rain, and the air is purer and drier than in any other part of the year."*

Continued heavy rains sometimes fall, but they seldom last many days. An exception occurred towards the end of last year, (1847,) when Pinang, for the first time since our occupation of it in 1786, was inundated. The flood happened on the 7th November. "The whole island almost was under water. The rivers burst their banks, and carried away several bridges, land-slips occured on the hill ground, houses fell, and property both public and private was much damaged."†

"Heavy dews prevail throughout the year in clear nights; fogs too are frequent in the mornings, especially during the more rainy months. From repeated observations of Daniell's Hygrometer, in both moist and dry states of the atmosphere, the average difference between the external and internal thermometers, at the point of condensation, has been found to be about 10°. The barometer has been found to range always about 30 inches, with a daily variation of .08, the maximum being at 9 o'clock A. M. the minimum about 3 P. M."‡ The regular tides which prevail in the atmosphere within the tropics have been the subject of observation at Pinang. Colonel

* Dr. Ward's Contributions to the medical topography of Pinang, p 21.
† Pinang Gazette of 1st January 1848.
‡ Dr. Ward's contributions to the medical topography of Pinang, p. 21.

Low says, "the barometer has been observed in Pinang to perform 4 revolutions in the twenty four hours. At

4 A. M. It is lowest and remains so a short while, then ascends; until

10 A. M. When it remains some time stationary and then *descends* till

4 P. M. When it is at its *maximum*, it is again stationary for a short period and then between

10 P. M. and 4 A. M. } It descends to the minimum.

These revolutions are most regular, and the maximum and minimum are greatest at the full and change of the moon."*

Although the general climate of the Peninsula is characterized by humidity, it is subject, like Sumatra, to droughts which appear to approach to periodical. Marsden states, that droughts of long continuance occur in Sumatra, and gives a particular account of one which happened in the year 1775 and lasted eight months. Our experience in the Straits is yet brief, but it leads to the conclusion that that marked droughts of longer or shorter continuance are liable to recur every five or six years in Pinang. The recorded droughts of long continuance are those of 1816, lasting 56 days (2d. January to 27th February, with the exception of one rainy day), 1821-22 last-nearly four months (December to March) during which period "scarcely a drop of rain fell."† Twenty years later a drought of equal duration occured at the same season, and in its effects was the most severe of which there is any record or recollection. It lasted from the middle of December 1842 to the middle of March 1843, and was attended with much and universal evil. Spice plantations

* Dissertation on the soil and agriculture of Pinang &c, p. 318. Baron von Humboldt observes with reference to the intertropical aerial tides, "I everywhere observed that the barometer attains its maximum at 9 h. or 9¼ h. in the morning; that it descends slowly till noon, but rapidly from noon till 4 ½ h. that it reascends till 11 h. at night, when it is a little lower than at 9 h. in the morning; that it sinks slowly all night till 4 h. in the morning, and again rises till 9 h..... In some places of the torrid zone the barometer indicates the real time within a quarter of an hour." Personal Narrative vol. 6. p. 700.

† Dr. Ward.

on the plains were preserved at a great expence by artificial irrigation, and in spite of every care many trees in unfavourable soils died. Betelnut and fruit trees perished in great numbers. The rice crops suffered severely. The supply of water progressively diminished, and the whole country assumed an arid aspect never before witnessed, and appearing to the inhabitants, accustomed to perpetual verdure, to be out of the ordinary course of nature *

At Malacca, according to Dr. Ward, the temperature of the whole year does not vary more than 14° or 16° Fah. being seldom higher than 88° and sometimes as low as 74°. The medium temperature, calculated from a daily register for 3 years, was found to be 80°. The climate approximates to that of Singapore in the frequency of showers, but the atmosphere is in general much less humid.

At Singapore the thermometer ranges from 68° to 92°, and averages 82°.† The climate is very humid, and rain falls frequently.‡ The annual quantity varies considerably, being affected by the irregular occurence of heavy rains at different periods of the year. The average annual fall is perhaps about 90 inches. The proper season of heavy rains, which sometimes, but very rarely, continue without intermission for several days, extends over November, December and January. In the Penny Cyclopædia, which contains so many admirable geographical articles, it is stated that "the southern portion of the western coast of the Peninsula, as well as the low eastern coast of Sumatra, is perfectly sheltered against both monsoons, the N. E. and S. W. In this country accordingly the regular succession of dry and wet seasons is unknown. Showers of rain fall in every month of the year, but more abundantly in our summer." Instead of saying that

* "In our retrospect of 1846 we remarked on the peculiarity of the seasons, the rains having continued up to the end of that year. On this occasion we have to notice a similar occurrence. During the last five or six years the Climate appears to be undergoing a gradual change. The dry season for three years past has not been so prolonged. Last year there could scarcely be said to be any, and the temperature both during 1846 and 1847 was at times considerably lower than it was during any part of, at least the eight or ten preceding years." *Pinang Gazette of 1st. January* 1848.

† Mr. Balestier tells me he has observed it as low as 66°, so that the range nearly embraces the ranges of both the plain and mountains of Pinang.

‡ Upon an average rain probably falls about half the number of days in the year.

we are perfectly sheltered from the monsoons, the writer should have said that the operation of the monsoons is influenced by the extent and ramifications of the ocean around us, und by the chains of mountains in Sumatra,—the former increasing the humidity of the air, and the latter interrupting the wind, and combining with the general configuration of these countries, and the circumstance of a great arm of the sea being interposed between them, to substitute variable breezes and occasional sudden and severe squalls for a regular wind. He should have added, not that rain falls uniformly or more abundantly in the months of the European *summer*, but that the earliest months of the N. E. monsoon, or from October or November to J anuary, corresponding to the European *winter*, constitute a decided rainy season attended with a lower temperature than is experienced in other months. Although it is true that showers are frequent in this region during the months that constitute the dry season in Ind ia, it must not be supposed that they fall almost every three days, as some writers have said. Droughts are common of 8 to 14 days, and longer ones happen every few years.

The tables for 6 years (1820 to 1825) furnished by Major Davis to the Asiatic Society, although of little use in determining the mean temperature of Singapore, owing to the noon heat being given as the maximum, serve to shew that, subject to great fluctuations, a certain seasonal distribution of heat throughout the year is observed. There is a winter or cold season when the sun is in the southern hemisphere in November, December and January, the minimum of heat falling sometimes in one and sometimes in another of these months. During the rapid passage northward of the sun across the equator, and the adjacent parallels, including that of Singapore, in the months of February, March and April, the temperature increases, sometimes rising at once to summer heat. When the sun is in the tropic of Cancer, and during his slow progress near it in the months of May, June and July, the summer occurs. In one or other of these months the maximum of heat usually falls. During the succeeding three months, August, September and October, when the sun recrosses the equator and the proximate parallels, the tempera-

ture decreases. It can neither be said, however, that there is a regular increase from the minimum to the maximum, and decrease from the latter to the former, nor that the above four divisions mark successive seasons of constant cold or winter, of regularly increasing temperature or spring, of constant heat or summer, and of regularly decreasing heat or autumn.*

In 1820 there was a regular increase from February to July. In 1821 there was a very slight increment (0. 4°) from Feb. to March, followed by a fall in April of 1. 8° and succeeded by a rise in May of 3. 5°. In 1822 there was a rise from February to May, in June a fall of 0. 7°, followed by a rise in July of 2°. In 1823 there was a rise from February to April, and a fall of 1° in May, followed by a rise of 1. 8° in June and July. In 1824 there was likewise a rise from February to April, a fall of 1. 4° in May and a rise of 1. 8° in June and July. In 1825 there was a fall from February to March of 0. 6°, a very slight rise in May, and a fall from May to July. Similar irregularities may be observed in the autumn months. In 1820 July must be considered one of these months, as the temperature fell from its maximum of 86° in June to 82. 1°, in that month. It then *rose* in August, September and October, and fell in November, Dec. and Jan. (1821). In 1821 it fell from May to July, rose in August, fell in September, rose slightly in October and November, and fell in December and January (1822.) In 1822 it rose from August to October, fell in November and December and rose slightly in Dec. In 1823 it rose from August to Sept., fell in Oct. and Nov., and rose in Dec. and Jan. In 1825 July may be considered an autumn month. The temperature fell slightly in Augt., rose from September to November, and fell 2. 6° in Dec. It thus appears that although the autumn months are colder than the summer, there

* The seasonal variations in temperature appear to be due in a greater measure to the influence of the monsoons, than to the position of the sun. The temperature would probably be nearly equable throughout the year, but for the cold winds and rainy and cloudy weather that occur. Sometimes one of our so called winter months exhibits a mean temperature as high as one of the summer months in the same year. Thus in 1821 the mean temperature at noon of November and July corresponded, 83. 9°. In 1820 that of November was 82. 8° and that of July 82. 1°. In both cases however it is probable that the mean temperature of July exceeded that of November.

is sometimes an increase instead of a decrease from the first to the last of these. In the years when this happened it is observable that there was a sudden considerable fall from the last of the summer to the first of the autumn months; in 1820 from June to July of nearly 4°; in 1822 from July to August of 4. 4°; and in 1825 from June to July of perhaps 2°. The transition from winter to spring or summer is also sometimes sudden. Thus in 1821 the temperature passed from 80° in Jan. to 83. 5° in February, and in 1825 from 80. 9° in Jan. to 85. 2° in February. In more recent years we have noticed this sudden change from the raw, cold, and rainy weather of the winter months to full summer heat in February. Cold breezes from the N. and N. E., however, continue for a time to sweep over us, and, when they rise, the instantaneous transition from hot to cold is far from agreeable.

In 1820 the maximum of heat was in June; in 1821, in May; in 1822, in July; in 1823 in *September*, (but there was nearly the same temperature in April and July); in 1824 in July; and in 1825 in *February*.

The minimum of heat was in the cold season of 1820-21 in January; in 1821-22 in December; in 1822-23 in December; in 1823-24 in November; in 1824-25 in December.

The imperfection of our meteorological registers has obliged us to give the preceding details instead of a more general account of the climate, which could hardly have been rendered accurate. Before we can safely reduce our experience into general laws, we must have regular contemporaneous observations carried on at our three Settlements for a period of not less than ten years. The irregularities, when a few years only are considered, are so great that even that period would probably be too short.*

Currents. The currents of the Straits of Malacca are remarkable. From the Arroas to Junk-ceylon the current in both monsoons

* These observations would be attended with little trouble and expence when the requisite instruments had been once provided, and we venture to express a hope that when the subject is brought to the notice of Government it will be induced to furnish them, and take measures for ensuring an uninterrupted series of observations. We have no doubt that at each Station individuals will always be found who would willingly superintend them.

sets generally to the northward. This appears to be due in the N. E. monsoon to the influx of water from the China sea at the southern extremity, and the flow of the Bengal sea to the S. W. thus causing a draught at the northern extremity. In the S. W. monsoon again, while the sea of Bengal on the one side flows to the N. E., a further draught is occasioned by the monsoon being changed on the west coast of Sumatra into a N. W. one. Thus, while on the Sumatra side of the Straits, the current runs along the Pedier coast and out of the Straits to the westward, it is setting on the opposite side to the northward. During the same monsoon the current about the Arroas sets often strong to the N. W. with a weak flood at times to S. E. From the Arroas to the Carimons regular tides prevail from one side of the Straits to the other. The ebb which sets to the N. W. is longer and stronger than the flood. The flood sets to the S. E. as far as the Carimons. Between this group and Tree Island it meets the flood running in from the China sea. After the junction the flood sets to the southward towards the Straits of Durian. The meeting of the two tides causes great irregularities, so that in the Straits of Singapore they sometimes set for 6 hours in one direction and then 12 to 18 in the opposite. They are frequently very rapid, and at some places run in eddies.*

The effects upon the Peninsula of the aqueous agencies of which we have given the preceding imperfect account, are great and obvious. They have given a distinctive character to the whole coast, for we recognize them equally in the broad plains and mangrove swamps, and in the abraded promontaries and ranges which separate them. From the great irregularity in the original configuration of the borders of the Peninsula, causing numerous broad and deep hollows sheltered from the sea, it has resulted that the accessions which the country has received, greatly exceed the extent of land that has been washed away, if we consider superficial area alone. What may be the proportion of the bulk of alluvium deposited around the shores, to the bulk of abraded matter which the interior has lost, is a question not so easily answered. Some portions of the coast have gained

* The facts in this paragraph are derived from Horsburgh.

far more than any others, and are still gaining. Others again, such as considerable tracts along the east coast, appear to have been always losing. In others there are evidences of alternate periods of advance and retreat..

Rivers and Alluvial Formations.—We have hitherto delayed noticing the rivers of the Peninsula, because it appeared advisable, in order to avoid repetition, to describe them in connection with the alluvial plains through which they flow, and which they have so largely helped to form. We now propose to follow them round the coast, observing the extent and nature of their plains, and pausing, where we have some some personal knowledge of the localities, to describe the mode in which these plains appear to have been produced.

The Peninsula is an exceedingly well watered region. The climate, as we have seen, is humid, and the whole length of the country intersected by vallies and ravines. Hence streams abound everywhere. It is probable, from the structure of the country, that the upper branches of most of the larger rivers flow generally S. E. and N. W. between the short mountain ranges, and that it is only on reaching the borders of the ancient coast line, or inner edge of the alluvial plains, that they take an easterly and westerly direction. This we know to be the case with some of them. The same fact may be observed with reference to the smaller streams of the hill systems.

Most of the rivers and streams are properly creeks for some distance from their mouths. After proceeding for some time up the winding reaches of a deep and broad creek, we frequently find that it terminates suddenly, and receives only a scanty rivulet of fresh water. The number of these creeks is very great.

The principal rivers that discharge their waters along the west coast are the Kedáh, Pérák, Sálángor, Lingí, Muár and Bátu Páhát (Rio Formosa). Besides these, there are hundreds of intervening streams.

We have no accurate information respecting the courses and bulk of any of the rivers.

The Kedáh rises in the mountains that form the watershed be-

tween the eastern and western coasts, and, after receiving numerous tributaries, enters the head of the Straits of Malacca in latitude 6° N. nearly. The extensive level tract through which it runs so far as it has been examined, appears to be entirely composed of alluvium deposited by it, and a large mud flat which fronts its mouth indicates the continuation of this deposit. At its mouth it is about 300 yards broad, and for some distance is navigable for vessels of 300 tons burden. The tide rises from 5 to 6 feet.

The coast opposite Pínáng affords the most positive evidence of the gradual encroachment of the land upon the sea. The process of advance may be observed in different stages. Off the mouth of the Juru, and between Bukit Juru and the mouth of the Junjong, the sand has greatly accumulated. The large flat in the middle of the south channel has now so spread and shoaled, that the channel between it and the mainland is blocked up. The sand bank running south from the end of the Town has also shoaled and increased, till it has obliterated the passage between it and Pulo Jeráják, and debarred all entrance into the channel between it and the Island. The most interesting instance of recent accumulation, however, is afforded by the northern coast of the Province from the embouchure of the river Múdá to beyond the former Police Office at Teloh Rámis. The extensive mud bank stretching out in front has been raised so rapidly, especially to the northward, that the owners of the lands on the adjacent coast have obtained valuable additions to their property, and rice crops of unrivalled luxuriance, and cocoanuts distinguished for their lusty and rapid growth, now cover tracts over which the tides rose seven years ago. The formation, in a former century, of a broad elevated band of sand along the coast of the Province, stretching, in a line deflected towards the west, beyond the projecting angle of the alluvial flat of Pinang, where the town stands, has given a similar direction to the current, throwing it towards the Pinang shore, and projecting the southern coast of the Province, where there has, consequently, been a great deposition of mud and growth of mangrove jungle. Older sea banks of sand* traverse the alluvial plains between the Mudá and the Juru,

* As we have not carefully examined those elevated bands of sand (call-

and carry the geological records of the Province back to a remote period, for the first settlement of the Malays, KotáAur, is only within the most recent, and monuments of still earlier inhabitants exist. Since the Malays established a colony at Kotá Aur (probably six centuries ago) the land seems to have increased about a mile and a half in breadth. The accumulation of mud appears to have eventually compelled the colonists to abandon the settlement and proceed to Kedáh. Bátu Káwan is now so completely embraced by the land that its coast forms one line with that of the Province. Until recent years it was not generally known to Europeans that it was still an island. In older maps it is laid down as part of the mainland. The small hill called Bukit Duráká Juru has large rounded granite rocks on its western side, which must for ages have been exposed to the abrasion of waves and currents before the Province existed as dry land; but the mangrove swamp still comes up to it, and shows that it is only recently the waters of the sea have ceased to sweep past it. This hill consists of granite, and its eastern side preserves a monument of a recent upward movement in a spur, about fourteen feet above the level of the plain, consisting of oysters and other modern marine shells, imbedded in a hard black earth. Bukit Mérâh is four miles from the coast, but the flat plain surrounding it contains recent shells. From the steepness of the seaward face of the hill, and its general configuration, it may be inferred that a considerable portion of it was devoured by the sea, and that it consequently existed as an island during a long period subsequent to its elevation. The Malays of the Province, who are naturally observant of natural phenomena and thus make a rude geology of their own, unhesitatingly assert that all the isolated hills scattered over this part of the Province were formerly islands. The native annals of Kedáh even go back to the time when Gunong Jerái, or the great mountain mass called Kedáh Peak, now 25 miles inland, was surrounded

ed *permátángs* by the Malays) we are not at present able to offer any decided opinion whether, as Colonel Low believes (Dissertation &c.,) they have all been heaped up by the waves along the ancient lines of beach, or, as may have sometimes happened, were banks formed while the Straits behind them were still under the level of the sea.

by the sea; and it hardly needs this tradition, which may have been derived from the aboriginal occupants, to support a conclusion naturally resulting from the flatness of the circumjacent alluvial country, the shells that have been found in it, and the circumstance that two rivers, the one (a principal branch of the Kedáh River called Simpáng Rámbie) flowing to the north, and the other (the Mirbou) to the south of the mountain, are connected by a channel behind it. In the large flat plain lying to the north of Gunong Jerái, and about 6 miles from the sea shore, is situated a singular mass of limestone called the Elephant Hill. Judging from Dr. Ward's description, it affords many evidences both of recent elevation, and of having for centuries been an island. Its sides are steep cliffs, and several detached columns, apparently resembling those found near the Meuse in France, and on the sides of inland limestone rocks in other countries, together with numerous stalactitic caves, shew the abrading action of the waves. Dr. Ward notices a mass of recent shells elevated about 8 or 10 feet above the level of the plain. This mass appears to be entirely similar in its component shells, and the basis in which they are agglutinated, to the larger mass which we observed on the north side of B. Duráká Juru. The Elephant Hill, if examined more minutely, would probably afford important evidence respecting the nature of the movement by which it was elevated, whether abrupt, or slow and constant, or by successive steps interrupted by periods of quiescence. Captain Newbold suggests the careful examination of the caves with a view to the discovery of organic remains. But, situated as it is in a very modern alluvial plain and surrounded by a swamp, it is not probable that any of the caves are ossiferous.

Before quitting this part of our subject, the general relation of the island of Pinang to the alluvial formations along the shores of the mainland requires to be noticed.

The revolutions which have taken place in the channel between Pinang and the mainland are deserving of a more extended examination. We have little doubt that, from the various accessible vestiges that remain, the whole past geological history of the alluvium of the Island and the Province could, without much difficulty, be unravelled.

It is probable that, prior to the formation of the great bank of sand which stretches along the present margin of the northern half of the Province to Kwállá Pry, the main current flowed in a direction across or behind Bágán Boyá and Bágán Dálám, sweeping past or round B. Duráká Juru, and being deflected by the elevated hilly ground which terminates in B. Juru in a S. S. E. direction through the eastern channel, which, when we acquired Pinang in 1786, had a depth at its northern entrance of 7 and 8 fathoms, but which has now shoaled much throughout. When the central course of the current occupied the position above indicated, the mud must have accumulated within a line prolonged in a south easterly direction from one drawn from the rocks of Pulu Tíkus to those off Tánjong Tokong. If we go back to an earlier date, before Permátáng Pow, Permátáng Pássier &c. were formed, and when the current embraced B. Méráh, we have an arrangement of forces still more favorable to the deposit of silt in the space now occupied by the alluvial triangle of the N. E. plain of Pinang. Without a direction of the main current in the above course, leaving this a space of slack water, it is not easy to conceive how the alluvion of the island could have been drawn out in a triangular direction to the eastward. If the current, passing outside of P. Tíkus and T. Tokong in a south easterly direction, continued its course to the south of B. Méráh, sand banks would be formed on this space in lines tending to an approximate parallelism with its course, but modified by the configuration of the then coast of the Island behind.

Looking to the extensive tract, several miles broad, now forming dry land, over which the sea has left positive evidence of its recent retreat, we cannot but conclude that Penang itself, in the progress of a few centuries, will be surrounded by the mainland. Its distance from the latter, which, at the Fort, is now considerably less than 2 miles, must, at a date subsequent to the last elevatory movement of the land, have been from 10 to 12 miles. When we observe the present accumulations of sediment from the various rivers whose earlier deposits formed the plain of the mainland, and combine with our observations the historical records which we possess, it is almost

possible to foreshew the period within which this plain will embrace the Island. The Kedáh, Mirbau and Mudá rivers, with the intermediate smaller streams, have formed a great bank of mud stretching out to sea, over a broad band of which, between the northern shore of the Island and the mouth of the Mirbau, there is nowhere more than $4\frac{1}{2}$ fathoms of water. Within, or to the south of, this band, the opposite coasts approach, and the current, thus confined, as it advances acquires strength, and scoops out a deeper channel, so that, at the narrowest part of the strait where it has been restrained by the Fort and embankments from carrying away the land on which the Town stands, there is no less than 14 fathoms of water. So long as this rapid and powerful current continues, the effort of the sea will be to widen the interval that separates the island from the mainland at this their nearest approach. But much of the sediment that would otherwise have been carried through the broad channel which would naturally have existed, is thus thrown on the bank beginning at the old Police office of the Province, and the remainder tends to enlarge the banks in the south channel. In process of time the gradual shoaling of the sea over the great bank to the north will diminish the force of the current, and, as the bank extends continuously behind and stretches well out, there is little probability of a channel being worn through it by the current tending to the strait, especially as the accession of mud in the south channel will exercise a similar resistant power in that direction. Along the coast to the south of Pinang the mud is increasing more regularly and surely than to the north, for it lies further into the Straits of Malacca, and is protected by the Island from the heavy waves of the Bay. The great mud flat that stretches continously from the Dindings, having a length of 50 miles and a breadth of from 6 to 8, already advances its north western extremity to a point further out than the seaward side of the channel between Pinang and the mainland, and nearly in a line with the centre of the southern coast of the Island.* Over this flat the mangroves are slowly

* The existing charts give a very imperfect representation of the outer edge of this bank which may be owing to a considerable period having elapsed since the soundings from which they were constructed were made The proper N. W. extremity lies much more to the west than the point to which

but incessantly marching, continually enlarging the limits and raising the level of the land, and as they approach, the edge of the bank retreats to seaward. Already its line is almost continuous with the west or seaward shore of Penang. Thus by the progressive advance of the banks and shoaling of the flats on the north and south of the Island will the current through the channel be slowly impeded and abated, and the western shore of the Island eventually become, in all probability, the coast of the mainland.

The uninterrupted and rapid advance of the mud flat on the coast of Pérák has been mentioned. This has been going on from time immemorial, and a great champagne country, covered with dense jungle, the effect of this process, is at present seen stretching far back, unbroken by any hills or rising ground, to the foot of the mountains of the interior. This tract is projected into the Straits at its southern extremity by a group of hillocks which are continued in the sea by the Dindings. Between 7 and 8 miles to the south the summits of another less elevated group rise above the sea level in the form of the Sambilang Islands.

Opposite this group, the river Pérák, one of the largest of the Peninsula, disembogues, bringing down large quantities of sediment from the continent, which, owing to the current of the river flowing into the sea in a north westerly direction, appears to be chiefly deposited to the south. The Pérák appears to have a considerable descent, as, during the rains, the water is fresh and the current strong within a mile of the sea. The country drained by it is large, and its feeders are very numerous. From its mouth, where vessels with a draught of 12 feet can cross the bar, to the source of its higher feeders in the mountains, where it meets the eastern country of Pátáni, is said to be nine days pulling and poleing through a course of about 150 miles. The breadth in the alluvial tracts, or while it remains navigable by vessels drawing 15 feet, is irregular, but reaches a mile in some places. Judging from its size and the velocity of its current it is probably the largest river on the west coast.

we have alluded. It is in fact in the same meridian with the western coast of Penang.

From the Pérák to the Sálángor, the next large river, the advance of the land has been great. A perfectly level country extends inland to the foot of the mountains. At the mouth of the Sálángor there is a hill. To the south lies an extensive mangrove swamp. In the interior one of the feeders of the Sálángor is said to unite with Sungi Ginta, which flows eastward and joins the Páháng.

The character of the Straits now changes. Abreast of Sálángor commences a large tract of islands, rocks and sand banks, stretching to the southwest in the Arroas well across the Straits. The North Sands, it is highly probable, and partly attested by soundings, are disposed upon summits of rocks. Pulo Kállam and Pulo Lumat are merely low mud flats covered with jungle, and separated from the mainland, which here entirely agrees with them in character, by narrow channels kept open by the strong currents which set through them owing to the great sandy flat which stretches to the northwest opposing the progress of the tides. Another considerable river, the Kálang or Kállam, the head of which approaches within one day of the Páháng, aids the Sálángor in producing this large mud deposit.

Beyond Lumat point the Straits become narrow. The coast of the Peninsula has hitherto advanced in a nearly uniform S. S. E. direction, and that of Sumatra in a S. E. by E. direction, forming two sides of a triangle gradually converging towards an apex at Pulo Roupat. From P. Lumat, however, the coast of the Peninsula is abruptly deflected in its direction to N. W. by W.. S. E. by E. so that its line becomes nearly parallel to that of the Sumatra coast, which continues the same as before.

When abreast of Parcelar hill the conclusion is at once forced upon us that it was formerly an island. The coast in front and on both sides, and the country for a great breadth behind it as far back as the mountains, are quite flat. To the north, Kállam and Lúmát are seen as level as the sea, and scarcely rising above it, and the mainland, for perhaps 20 miles inland, seems to be a continuation of the same level. The mountains in the interior are very irregular, towards the north and south peaked or deeply serrated, and about the centre, more even and bulky, but this must in some measure arise from the position of

the spectator. Two ranges are distinguishable. The northern larger and gradually sinking into a low wall like ridge, terminated by an isolated hill. The southern more peaked and terminating abruptly in the plain. This range appears to be the last of the great middle chains or groups of the Peninsula. The termination is probably near the latitude of Parcelar Point, or perhaps a little to the south. The ranges on the eastern side of the Peninsula, according to Horsburgh, are observed from the China sea to terminate near the parallel of Pulo Varela, which is further north, so that the line on which the southern faces of all the principal ranges rest is probably conformable or perpendicular to the direction of the chain.* From this latitude to Singapore there are some bulky ranges of no great length, such as the Rumbou mountains, and great isolated masses, such as Mt. Ophir to the south east of Malacca, Mt. Formosa, and, near the extremity of the Peninsula, G. Pulai on the west and, on the east, G. Pántei and the Lulumat group, all there visible from Singapore.

From Lumat Point to Tánjong Buru (the southern extremity of the mainland) a distance of 160 miles, the coast pursues a direct and regular course, contrasting so greatly in this respect with the northern portion of the coast and with the opposite coast of Sumatra in particular, that we naturally look for some general cause to account for a circumstance so remarkable, and we think it will be found that the uniformity of the Peninsular coast, and the broken insular character of the shores of Sumatra, are both occasioned by the contraction of the Strait, and the consequent increased force of its tides; on the one side gradually abrading old alluvion, partially protected by a series of rocky points, and, on the other, preventing the regular accumulation of new deposits, keeping open channels, and causing mud to rise in the form of banks and insular flats. Sumatra is here traversed by four large rivers, the Raccan, Siák, Kámpár and Indrágíri, which flow through a country perfectly alluvial and flat, and of great breadth. The whole of this country is evidently the cre-

* We observed, however, that on the east coast, although the country between the Sidili and Indau (traversed by the Simrong) was only hilly, the northern branch of the Indau and its feeders rose amongst mountains, which were in groups stretching continuously to the northward.

ation of these rivers, and the vast accumulations of alluvial matter at their mouths evince their undiminished energy in transporting the detritus of the mountains to the sea. It is evident that the sea formerly covered the whole of the broad alluvial plain to the commencement of the mountain slopes. At that period perhaps the greatest current was on the western side of the Arroas, and across a tract now forming part of Sumatra, and, at all events, the current of the Straits spread over an area more than twice the breadth of the present channel. The comparatively feeble rivers of the Peninsula would then be aided by the gentler tides in filling up the hollows between the ridges and hillocks, and extending their alluvion seaward. But with the swifter advance of the opposite shore through the operation of the more powerful rivers of Sumatra, the tides would increase in force, oppose a resistance to the contraction of their banks, and turn their erosive action against them with the more effect the further they encroached. The result of this interaction would be very different on the two banks. On the Sumatra side the balance of accumulation and abrasion would be in favour of the land. On the side of the Peninsula it would be in favour of the sea. At this stage we conceive the Straits are now arrived. How long it has continued, we have as yet no data on which even to build a surmise.

When in Malacca for a few days in March 1846 we resided in a bungalow close to the beach opposite Pulo Upé. From the height and appearance of the alluvial plain, which is slowly wasting, we think it may be inferred that it is of great antiquity, that, at one time, it extended much further into the Strait, and that it is probably many ages since its coast has ceased to advance and begun to retrograde. The appearance of the growing parts of the shore of the Strait requires that we assign a former coast line at some distance seaward, and remaining stationary or advancing during a long period, to explain the accumulation of fine clay sediment to the level at which it is found on the existing coast, and the after accession of vegetable mould to a considerable thickness. On a subsequent visit to Malacca we were enabled to trace the same line of ancient coast, at a point further east, running inland at a slight angle

to the present continuation of the beach, which is a section of a newer and lower bank of sand on which the western suburbs of Malacca stand. Behind this bank is a cultivated clayey flat, from which the old coast line rises 3 to 4 feet This coast line, which is now covered with paddy, must have been the site of a village in former days, as numerous fragments of pottery and hewn stone are thrown out in digging pits. When the sandbank was formed in front, the Malays must have abandoned their old dwellings. The inhabitants have a tradition that Pulo Upé was formerly united to the mainland.

Tánjong Tuán (Cape Rachado) is evidently the remnant of a hill of which the greater part has been eaten away by the sea. The concave coast between it and Tánjong Kling is sandy, and, in several places, lined with rocks, and, towards Tánjong Tuán, with small islets. In this first characteristic it resembles the bight to the south of T. Kling, in which we found the evidences of abrasion so striking. We would not be understood to lay much stress on the character of the shore taken by itself, because in many places where the shore is yielding to the waves, the coast may be the field of great accumulations, destined, ere the lapse of many years, to convert the wasting shore into an inland ridge or permátáng. Thus a portion of the shore of Province Wellesley north of the Prye is wasting. On revisiting it in March 1846, after an absence of two years, we noticed that several cocoanut trees had been undermined and prostrated in the interval. Yet the mud flat in front is gradually rising and extending to the south. At Cape Rachado, on the contrary, the main current of the Strait flows, and, at a short distance from the point, there are 30 fathoms of water. As a general rule in the Straits (but subject to exceptions) a growing coast is covered with mangroves and overflowed by the sea, and a wasting coast is above the sea level and has a sandy beach in front. Even where the soil is clayey, the finer particles being suspended and carried away by the ordinary tides, and only the coarser left, a beach of this kind is formed. We may remark that in the middle and southern division of the Straits, there are no strong waves driven perpendicularly on the coasts from the open sea, and consequently broad and elevated sandy ridges or permátángs are not so liable to be form-

ed as along the northern coast. Hence in these parts the above general rule may be pretty safely applied, even where the shores can only be observed from some distance. We believe the greater part of the coast from Lumat to T. Buru, if examined minutely, would prove to be, on the whole, a wasting and not an advancing coast; although at particular places, owing to the nature of the sea bottom in front, the configuration of the shore, and the set of the currents, alluvium is at present being deposited. For instance, at present there is a considerable bank stretching along the shore from Point Sizan off G. Bánáng (Mt. Formosa) to Pulo Cocob. Before the tidal currents assumed, or sufficiently deepened, their present channels, they must have flowed with greater force over the space now occupied by this bank and within Pulo Pisáng.* The channel is now between the edge of this bank and Channels Bank, the projecting land of T. Buru having probably tended to throw the ebb or greater current off the shore, and scoop out a channel in a direction right up the Strait. The bank is now rising, the water on it between Pulo Pisáng and the main, having been found by Captain Congalton and Mr. Thomson in 1846 to be much less than the depth in the ordinary charts. It will probably continue to decrease until T. Buru is wasted, or the channel between Sumatra bank and the Long Middle bank is filled up by the advance of the former. Tánjong Buru is protected by the islands, rocks and shoals stretching from T. Gul to the Rabbit and Coney, but is at present wasting.†

* On the east side of the most westerly of the small islets close to P. Pisáng, Mr. Thomson found barnacles, or the casts of barnacles, converted into a hard siliceous rock, apparently a variety of Lydian stone. The impressions were very distinct and of different sizes, and the spot where they occur is five feet above high water mark. The elevation which this marks must be of an older date than that evinced by the agglutinated shells at the Elephant Hill and B. Duráká Juru (*ante* p. p. 118, 119.) It would even appear to be coeval with the great plutonic intumescence of the Peninsula, because rocks silicified and metamorphosed in precisely the same mode are found on P. Krimun Kichí, on the mainland behind the Old Straits of Singapore, at T. Pingráng, on the eastern islands (in the China sea) &c.

† In old charts it appears as an Island, and Mr. Thomson informs us that there is still the appearance of a channel breaking the line of coast. The Point is a low mangrove flat, and the Island was probably formed like Pulo Cocob by mangroves being trasported to a mud bank. From the point to P. Cocob the beach is sandy. A Biduanda Kallang of the Pulai informed us that he had crossed from that river to the coast, and found the whole to be a soft mud.

The only two large rivers which the Peninsula possesses along the coast from Point Lumat to T. Buru, are the Muár and the Bátu Páhát. The former is apparently about 600 yards broad at its mouth, and 100 yards, 18 miles up the river. There are no rivers of considerable size for about 90 miles south of Lumat, and this arises from two thirds of the breadth of the Peninsula lying here to the east of the watershed. But although the Muar does not fall into the sea until 2° N. L., it probably acquires its size from running within the outer ranges of the mountains, in a direction nearly pårallel to this part of the coast, and for nearly the same length. At the bar the depth varies from ¾ths. of a fathom to 4 fathoms. The general direction is at first N. E. through an alluvial flat. Its course has not been described beyond Gressik, which Captain Newbold visited. From information obtained on both sides of the Peninsula from Malays and Binuá, we believe that it rises in Gunong Bermun,* and then runs in a south easterly direction through a mountainous country. When it has passed the latitude of Mount Ophir, it receives the considerable tributary of the Sigámet, and, bending towards the S. W., pursues that direction to the sea.

The Bátu Páhát (Rio Formosa) falls into the sea 19 miles to the south of the Muar. Although inferior in size to the Muar, it is a remarkably fine river. It is deep, and proceeds E. N. E., gradually contracting in breadth from 100 yards to 50 feet, for about 20 miles by a winding course, through a plain so low that it is overflowed by high tides. It then bifurcates, one branch proceeding towards the N. W. and the other towards the W. The first branch rises near the Muar, and in the same hill where one of the feeders of the latter, the Págo, has its source. The second branch rises in a marsh, from the opposite side of which a river bearing the same name (Simrong†) flows eastward and joins the Indau, which has its embouchure on the eastern coast. Near its mouth, the Bátu Páhát receives a large tributary from the north, which drains the district between it and the Muár. The southern side of its estuary is formed by a range of low

* See ante vol i. p. 217.
† See ante vol. i. p. 215.

mountains which have been an island (a Pinang on a smaller scale.)

We will reserve a more particular account of the tidal action and modern alluvial formations at the extremity of the Peninsula, till we treat of the geology of Johore in detail, and before leaving the western coast, mention some facts illustrative of the advance of the Sumatra coast, and corroborative of the view above taken respecting the shifting of the Straits from the Sumatra to the Peninsula side. It may be gathered from Mr. Anderson's work* that the country, so far as observed by him in ascending the principal rivers from Déli to Siák, is of an uniform modern alluvial formation. The first layer consists of black mould, varying in thickness from 2 to 10 feet. The next layer is stiff white clay, 3 or 4 feet thick. The third or lowest is composed of sand and gravel, with fragments of granite intermixed. Near the hills up the Assahan River, the highest layer is red earth, and this rests on mud and sand. Higher up, large masses of granite and light sandstone were found on the margin of the river. At Jámbí, Lieutenant Crooke found the soil to be, 1st. a layer of rich vegetable mould, 2nd. a layer of clay, 3rd, at the depth of 11 or 12 feet, a layer of peat, four feet in thickness "containing trunks of trees of various dimensions, the bark undecayed and the fibres of the wood retaining much of their natural colour, strength and elasticity," 4th. a layer of fine light coloured clay. Neither stone nor gravel were observed in the soil. But pebbles of quartz and fragments of ironstone are washed down by the river from the interior, and deposited on the sand bank."

Besides the great rivers, innumerable smaller ones traverse the country and are frequently united by channels. All the lower part of the country is subject to periodical inundations. Whether, since the deposit of the oldest layers of alluvium near the hills, there has been any elevation of the land does not clearly appear. It is true that the largest part of the present surface of the alluvial country is considerably above the level of the sea, and there seems to be a gradual but slight rise from the present coast to the hills. It does not however appear that this is greater than can be accounted for by the

* See Anderson's Mission to Sumatra throughout.

ordinary action of tropical rivers, or inconsistent with the supposition that the line where the lower slopes of the hilly ground, when they attained their present elevation, met the sea, is distant from the line where the highest tidal wave now ceases. When the first alluvium was formed along the base of the hills, its surface would incline to a level. By the accumulation of matter in the beds of the rivers they would be raised above the surrounding level, their courses would shift, and by these means, and the constant periodical inundations, the face of the land would gradually rise. In time, by the greater deposits nearer the hills of heavy detritus in the shifting channels, and of lighter matter from the inundations, the older portion of the alluvial tracts would acquire a slope. In the earlier ages of their history the inundations from the interior would probably rush down the valleys over broad areas, and, when they entered the plain, spread over them, and deliver their more bulky spoils over wide tracts. At this epoch the alluvium would tend to rise rapidly above the sea level and encroach on the valleys. In later ages the valleys would have become wider and lower towards the interior, and deeper channels have been excavated in them. As the level of these channels above the plain descended, the channels in the plain would also be scooped deeper. The slope of the plain, and the softness and want of cohesion of its materials would facilitate this operation. In the result, a broad and deep trough would be formed, capacious enough to contain the waters of inundation. The river would then cease to increase, and rather tend to abrade, the older part of the plain, and the detritus of the mountains would not be deposited until the loaded waters reached and overflowed a newer external tract of alluvium, less elevated above the bottom of the channel. It is also to be supposed that during the earlier periods of the physical history of a country like Sumatra, consisting apparently of plutonic and volcanic rocky masses elevated beneath or through stratified formations, the detritus would be more abundant than in after ages. The surface of the newest sedimentary strata would be often soft and easily yield to the rains and torrents. From the summits or higher levels of the plutonic ridges, where the abrading action would be greater, all the softer rocks would gradually be

carried away. If in the present day, when the more exposed strata have been probably long since stript off the higher mountains, when the volcanoes have ceased to feed the channels of the mountain streams and rain courses with sand, ashes and tufaceous matter, and the less elevated stratified hills and slopes are densely clothed with vegetation, we are struck by the great accumulation of alluvion going on along the whole east coast of Sumatra,* how vast must have been the amount of matter poured down from the bare and easily abraded heights in the rainy seasons of the first ages of the Island. Broad as the eastern plains are, it does not appear necessary to refer either their formation or elevation to other than merely alluvial causes, more especially as the breadth of the different basins of the great rivers seems to be in some degree proportioned to their respective magnitude. All the facts hitherto recorded are consistent with a strictly alluvial origin.

The course of the Jámbí, for instance, has been accurately surveyed from the mouth of the northern and western branch, the Kwállá Níor, to the town of Jámbí, which is distant in a direct line from the mouth of the main branch nearly 60 miles, but much more following the windings of the river. The water flows up as far as Ukam which is about 40 miles in a straight line, but the tide retards the stream and produces a rise of two feet at Jámbí, and this although there is no estuary at the month to cause a high wave to rush up the river, and the force of the littoral tides is broken by Tánjong Bon. The channel increases in depth from the mouth,—where it is 16 feet and the banks are only a little above the level of the sea at low water and consequently uninhabitable,—to Jámbí, where it is about 40 feet deep, and the banks 20 feet above the ordinary level of the river. It is at some places below Jámbí nearly 100 feet deep. In the rainy season it rises from 12 to 15 feet, and at Muára Jámbí overflows

* The large islands of P. Rupat, P. Bánkális, P. Pádáng, P. Panjore and P. Rántáu, facing the Peninsular coast from Tánjong Tuán to T. Buru, are all alluvial, and appear to be great flats of mud formed by the sediment brought down by the Rákán, Siák and Kámpár. Extensive flats not yet raised to the level of the sea extend in front of the four last islands. About one half of the present breadth of the Strait is occupied by these islands and banks.

the banks, which are there 15 feet high, and inundates the whole country to the sea, a breadth of 50 miles.

The remarks of Mr. Anderson on the country of the Assahan river seem to show that the whole of it is alluvial, and the fact, before alluded to, of his finding near the hills a surface bed of red earth 8 feet thick, resting on mud and sand, is a strong proof that the gradual elevation of the plain towards the interior is due to accumulation from above in the mode before mentioned, and not to upheaval from below. Mr. Anderson mentions that the Malays have a tradition that the sea was formerly at Pulo Gorâb, which is 30 mile up the Dellí river, and affirm that, 200 years ago, it was at Serantan, 15 miles up the river Assahan. These traditions at least shew that the advance of the land is so marked as to force itself on the observation of the natives.

Upon a review of all the information we possess regarding the great eastern plain of Sumatra, the most reasonable conclusion at which we can arrive seems to be that it is entirely formed of alluvium, and that the western shore of the Straits was, at some ancient epoch, from 60 to 100 miles more to the westward than it now is.

If we extend our observations to the southward, we find that the great flat alluvial plain extends across the basins of the Palembang and Tulang Bâwâng rivers to the Java sea. It is thus almost certain that the greater part, as it is very evident that at least a large part, of the low country of Lámpong, Pálembáng, Jámbí, Síák &c., were once covered by the sea. The bearing of this circumstance on the modern geological history of that Archipelago of which Singapore is the most northern Island will be adverted to in a future paper.

Of the numerous rivers which fall into the Straits of Singapore the largest is the river Johore, the estuary of which is the finest in the Peninsula. The river itself has a long course, and preserves a considerable breadth and depth until it bifurcates. The eastern branch, called the Lingíu, rises in Gunong Lulumut, the highest of the most southerly mountain range, and the western, the Sáyong, amongst low hills.

Although the eroding action of tides and currents is feeble com-

pared with that of heavy waves or breakers, there are localities in which they appear to exert a large influence in the abrasion of points, and accumulation of alluvium. The Strait of Singapore afford many evidences of this. It is formed by a submarine valley cutting across the Peninsular range. The projecting belts of hills and their strata are consequently transverse to the direction of the currents. Wherever exposed, they are seen to be rapidly wasting. The horizontal strata of the Sígláp and Tánáh Mérá hills, having in great measure escaped the plutonic influence, yield rapidly, and have furnished materials for the sandy plains which stretch between and on either side of them, and the sand bank which fronts them. The sedimentary ranges to the west of Singapore plain, which have been variously indurated, charged with iron, and highly inclined, have opposed greater resistance to the sea; but the quantity of soft clays and shales which they contain has facilitated its action, and long ribs and ledges of ironmasked rock, stretching across the banks, mark at once how difficultly destructable they are in themselves, and how unavailing they have proved to save the hills which they bound together. At one place the sea has cut through some highly indurated strata and divided an island (Blákáng Mátí) in two, and, a strong current rushing through this narrow gateway into New Harbour, its old circuitous route around the northern end of the island has gradually been filled up with mud, and the detached northern half thus united to Singapore. The islands in the Strait are all greatly abraded. The plain of Singapore affords a good illustration of the mode in which the alluvial tracts of the Peninsula have been formed. Originally a bay, with numerous creeks penetrating between the hill ranges which form its boundaries and receiving the streams from the short ravines at their summits, these creeks have been gradually converted into vallies, and the bay into a plain. Several ancient sandy beaches have been preserved, rising above the clayey plain to heights which measure the difference between the ordinary high water level, or that to which the sea can deposit mud, and the levels to which waves of different force can roll up sand on beaches and banks. The different directions in which these permatangs run, with reference

to each other and to the present beach, shew how the alterations in the form of the coast have, from time to time, altered the directions of the waves and currents. One of the oldest, that which runs parallel to the Sírángun road across the wide mouths of the Bukit Tímah and Balestier vallies, on the west side of the plain, appears to have been coeval with the scarping of the flanks of the Sígláp range, on the east side of the plain, which are now separated from the sea by a sandy plain, but which have evidently been the "Red Cliffs" of ancient times. The present sandy beach extending from Sígláp to Tánjong Ru (Sandy Point,) where it projects in a long tongue into the harbour, has shut in the mud flat of the Géláng, given a common estuary to that stream, the Kálláng and the Rochor, and is rapidly forcing them to unite. The high beaches of sand have had different effects according to the level of the flats which they have banked in. Mud flats covered with mangroves and overflowed by the tides have been converted from salt water, into brackish, marshes. Lower flats, where completely blocked in by the sand beaches, have been eventually changed into fresh water swamps, in which vegetable matter has accumulated to a considerable thickness. The raising of the bottom of the bay above the level of the sea has been attended by a rise in the level of the lower part of the vallies.

With the exception of the Sidíli and the Indáu (of which a short account will be found ante Vol. I. p. 243) none of the rivers of the eastern coast have been explored. The southern principal branch of the Indáu, the Simrong, communicates with the branch of the Bátu Páhát of the same name. The Peninsula between the basins of the Indau and the Bátu Páhát consists of low hills. The northern branch of the Indau rises in Gunong Sigámet, which gives its name to the largest feeder of the Muár.

The Páháng is a large and important river. Its principal upper branch, the Sirting, is said to rise in Gunong Bermun, where the Muár, Sungi Ujong and Kálláng have their sources. The upper part of its course lies in a mountainous and hilly country, in which the only lake in the Peninsula of considerable size is situated. After a long course the Páháng falls into the sea in lat. 3° 34'. Its mouth

is divided by an island into two channels, of which the northern has a breadth of about 150 yards and a depth of 4 fathoms at high water. Above this the river is about a mile broad.

Of the other considerable rivers of the eastern side of the Peninsula, the Tingeran, Tringánu, Klántán &c. we know even less.

The islands off the eastern coast are in general rocky. The sides exposed to the N. E. monsoon are particularly steep, rugged and full of deep fissures and caves. Where small sandy coves occur, we observed in Pulo Tingí large pebbles of greenstone rolled to some distance beyond high water mark of the season of our visit, the close of the S. W. monsoon. Many were spheroidal, perfectly polished, and three and four feet in diameter, a size that would not be remarkable in stormier latitudes, but which is interesting as a measure of the force of the waves on the eastern coast of Johore compared with those on the western, where we never saw pebbles one twentieth of the bulk driven up in heaps on the beach.

The matter of which the alluvial tracts of the Peninsula are formed consists principally of clays, whitish, greyish, yellowish, bluish and blackish, with a varying proportion of silex. The clays of the Singapore plain appear to be less siliceous than those of Malacca and Province Wellesley. This may arise from the more felspathic character of the Singapore plutonic rocks. But it may be also due, in some measure, to the smallness of its streams, and the consequent slighter deposit of infusorial silex, which, considering the great number of streams and creeks in which the waters of the Peninsula meet those of the sea, must have furnished a large portion of the matter of the plains.*

* As a very considerable proportion of the matter of the alluvial plains and islands on both sides of the Straits of Malacca, must have been derived from infusoriæ, we subjoin an extract from a paper by Prof. Ehrenberg on the subject shewing some of his results: —

1. The minute microscopic animals of the sea extend up the bed of the Elbe, (and this is probably the case, also, in all rivers directly connected with the ocean,) as far as the ebb and flood of the tide are perceptible.

2. The flood-tide in the upper district of the river, even where the salt taste is no longer perceptible, as above Hamburgh, does not consist merely of an accumulation of the river waters occasioned by checking its outflow, but is now proved to be due to the direct introduction of the sea water, probably under the river water, and extending, very distinctly, as far as eighty English miles above the mouth of the river.

In the vallies of Singapore pure white pipeclay, of which fine white porcelain ware has been made, is found abundantly. It appears in general to be derived from the decomposition of the subjacent plutonic rock.

The vegetable deposits which occur in the alluvial tracts, and are frequently thick and extensive, are spongy masses of dead plants, (in which trees are often thickly imbedded), saturated and swollen with water, and resting on a black mud. When drained the level sinks considerably.

Shells are found, often very abundantly, in the alluvial clay. Beds of coral are also occasionally met with. The infrequency of deep excavations is probably the reason why, in localities inhabited from very ancient times, human remains are so seldom brought to light. In the inner part of the Singapore plain a piece of coir rope was found 6 feet below the surface, and a piece of wood bored through and having the hole filled with the twisted fibres of a piece of rope, was found in the town of Singapore at a depth of forty feet.* In

3. Since in the lower portion of the Elbe, the mud, consisting of a mass of clay and slime, which often interferes with the navigation, only accumulates so far up as the flood tide is perceptible, but above this point, the bed of the river consists of pure siliceous and other sand, it is evident, that the cause of this singular phenomena, which has hitherto not been sufficiently ex lained, is principally owing to *organic* conditions. It appears, in fact, that the mixture of river and sea water gradually kills vast multitudes of the minute organic bodies, and causes them to fall to the bottom, and form these accumulations.

4. The marsh land of the lower district of the Elbe, below Hamburg, *and, probably, of all rivers flowing into the ocean,* and considered as *humus*, does not merely or even chiefly consist of matter brought down by the stream from distant regions; and still less is it a local production of the minute animalcules existing in river water; but it is to a very considerable extent derived from organic beings existing in the ocean.

5. If we deduct the admixture of fine sand as a matter of uncertain origin, we shall find, not only at Cuxhaven, near the mouth of the Elbe, but also at Glückstadt, that from one quarter to one third of the mass of fresh mud is owing to the influence of marine animalcules, and that above Hamburgh, as far as the flood tide extends, the proportion is about half as great; but it has been already shown, that what appears to be fine sand may also, in a great measure, be an altered state of organic siliceous shells.—*Q. Journal Geological Society, vol. I. p. 252.*

* Mr. Thomson bored through 10 feet of blue mud and 30 feet of ferruginous earth before this piece of wood was brought up. Other 40 feet of hard ferruginous earths and clays were pierced at this locality (near the Hindu Temple.)

At the Gaol 55 feet of blue mud mixed with shells were found resting on red earth mixed with the bark of trees.

Banka, where tin pits are often dug to a considerable depth through the alluvium, there has been found a bed of turf, with wood which had been cut, below20 feet of clay; a boat, differing wholly from any of the kinds which have been in use from time immemorial, at a depth of 16 feet; and traces of a rice field in another deep pit.*

ADDENDA.

Heights of mountains.—(Ante p. 89.) In a M. S. plan of the triangulations on which Lieutenent Woore's excellent map of Pinang is based, we find the height of Gunong Jerâi (Kedâh Peak) given at 3894 feet, which is probably nearly correct. From a recent trigonometrical estimate by Mr. Thomson, it would appear that Gunong Lédâng (Mount Ophir) is about 4320 feet high,† at least 1300 feet lower than the height given by Captain Newbold. The height of the most southern mountain, G. Pulâi, has been trigonometrically ascertained by Mr. Thomson to be 2152 feet.

Climate of Singapore.—We omitted to notice a phenomenon peculiar to the southern extremity of the Peninsula. This is the warm and enervating winds which frequently blow in the night and mornings from the S. E., during the months of June, July and August. They are felt most towards the morning; and this, together

At Teluk Ayer near the beach the layers bored through were
Soft blue mud with shells,.. .. .. .. 40 feet.
Bright red clays, alternating with brown and yellow clays,.. .. .. 60 „
At the foot of Government hill near the Convict Lines there was found
White clays,.. .. .. 20 feet.
Red id. and laterite resting on a very hard white clay, ... 30 „
In digging "Tocksing's Well" nine feet of alluvial sand were found to rest on ferruginous gravel similar to that which occurs frequently on the hills near Singapore.

* Tijdschrift voor Neerlands Indie *8 Yaar. 11 Afl.*

† A theodolite observation made by Mr. Thomson on the Malacca shore at a distance of 29 stat. miles gave a height of 4,320 feet above low water mark. Mr. Thomson afterwards observed the peak to dip below the horizon when at a distance of 77 miles, and with the eye 3 feet above the level of the sea, which would make the height 4,300 feet. Mr. T. adds, in the memorandum with which he has furnished us, since the text was printed, of these observations and the borings mentioned in the preceding note, that he had no opportunity of taking more careful observations for the height of Mt. Ophir. but that the above cannot have an error of above 50 feet.

with the circumstance of their having only been observed within a short distance from the shore, induces us to believe that the peculiar sensation which they occasion (differing from that caused by the proper hot winds of India) is owing to their meeting the cold and damp nocturnal atmosphere of the Peninsula, which absorbs their caloric rapidly. Hence the feeling of warmth appears to be limited to a short distance from the sea. In the interior of Singapore they do not appear to be felt. In the band over which they extend, all the hollows having elevations between them and the sea, and even the leeward sides of hills near the beach, have the proper land temperature. The sudden change of sensation in passing from the sheltered to the exposed places, as a person may repeatedly do during a morning's ride, is very striking. Towards morning the difference between the temperature of the land, and that of the sea, atmosphere, is at its maximum. After sunrise the temperature of both is raised and equalized, and the contrast gradually ceases.

MISCELLANEOUS NOTICES, CONTRIBUTIONS AND CORRESPONDENCE.

The following facts, as illustrative of the great extensibility of membrane and muscle in the Serpent tribe, may prove interesting to some of your readers, as a sort of light desert after the more hearty meal of your regular and systematic papers.

On the 14th. ultimo a Boa constrictor was sent for my inspection, which had that morning swallowed a pig belonging to some Chinese at Sungi Kranjie. It would appear that the snake had been seen lurking about the stye several days previous to his last meal which cost him so dear; he artfully however escaped the owner of the swine, who had ineffectually attempted his capture or destruction on these occasions; but on the morning in question, the Boa succeeded in getting entrance into the stye, and, having helped himself to a Porker, found himself in the dilemma of the Weasel in the Barn,—he could not get out again. The owner came upon him in this state of helplessness, and, having called comrades to his assistance, secured the victim, torpid from his voracious exertions, and brought him in triumph into Town.

Now you will say there is nothing novel in all this, nevertheless the disparity of size between the carcase of the pig and the jaws and body of the snake struck me so forcibly, and appeared so extraordinary, that I forthwith proceeded to ascertain the exact relative proportions, and found them as follow. The snake was twelve feet, nine inches long, transerve diameter of jaw inside three and a half inches, neck round nine inches, greatest girth of body at thickest part, when pig was out, eleven and a half inches. The pig weighed thirty seven catties and a half, or rather more than fifty pounds, was a good three fourths grown young sow, and lay apparently without a mark of violence upon its body, not a hair ruffled, legs unbroken; indeed old Isaac Walton never dealt more tenderly with his frog than the Boa had seemingly done with young Piggy. Upon closer examination it was however discovered that the ribs were broken, but as the

animal remained in its place of sepulture some hours, sufficient gases had been generated to rectify the effects of the crushing and restore piggy to her pristine comeliness of shape; the contrast therefore was the more striking, but still it is quite inconceivable, how the animal was ever swallowed; how the head of the pig passed the jaws of the snake, would I think puzzle a conjuror to determine; and how the snake felt I leave to the consideration of some hopeless Dyspeptic. So distended were the walls of the abdomen by the unusual meal, that the whole pig could be seen plainly through them; they became diaphanous and thin as gold beater's skin. The vitality of the monster equalled his voracity, for, despite the numberless blows of clubs on its head, two hours after the pig had been cut out of the abdomen, I saw the tail firmly coil itself around a stake. Boa met with poetical justice, for, the same evening, he descended into the very little less revenous maws of some Chinese, who looked upon the flesh as something exceedingly piquant and appetizing, and eagerly they strove amongst themselves who should possess the largest share of it. O.

The Revd. Mr. Keasberry has favoured us with the first No. of a little monthly Journal in the Malayan language, intended for the instruction of children, and entitled "Taman Pŭngatauan bagie kanak kanak." It contains 24 pages, and is got up with great neatness. It is intended not only for the boys at Mr. Keasberry's school, but for general circulation in the Straits. It is printed in Roman characters, which will adapt it to the use of a considerable class who can read English, but to whom Malay is more familiar, although they cannot read it in the Arabic characters. In our next issue we shall notice the contents, and give a few extracts. In the meantime those of our readers who have the means of bringing it to the notice of the class in question, will confer a benefit on them by doing so, as the want of books in the Malay language adapted for children must have hitherto been a great bar to their improvement. The gratuitous distribution of a few copies would cost but little, for the price of a number is only 25 cents.

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VIEW OF THE STATE OF AGRICULTURE IN THE BRITISH POSSESSIONS IN THE STRAITS OF MALACCA.

By J. Balestier, Esq.,

Corr. Mem. of the Im. Institute, Member of the Academy of Rhiems, &c. &c. &c.

Before entering on the following rapid survey of agriculture in the British possessions in the Straits of Malacca it may be well to say a few words regarding the physical and political conditions of the country.

The "Straits Government" embraces the island of Pinang (Prince of Wales Island) and its adjacent Province Wellesley, on the Malayan Peninsula; the Island of Singapore; and Malacca situated like Province Wellesley on the mainland. The three Settlements lie on the easterly side of the Straits of Malacca, occupying as many unconnected spots from lat. 1° 17' to 5° 25' North and 100° 25' and 104° East Long.

Each of the three Settlements has a presiding Magistrate, under the name of Resident Councillor, and over them presides a Governor appointed, as the Resident Councillors are also, by the Governor General in Council of India. The Straits Government is subordinate to the Government of Bengal.

The aboriginal population consist of Jakoons, a people quite in a state of nature who are the tenants of almost impenetrable forests,

and of Malays more or less civilized. To set down the population of the country at one person per square mile is not thought to be an under estimate by those who have had the best opportunities of judging after exploring the interior. This estimate of course does not refer to the large towns in the occupation of Europeans.

The climate of the Straits is rather more humid than dry. There can hardly be said to be, as in most other tropical countries, a dry and a wet season, and hence an agreeable temperature and continual verdure prevail throughout the whole year. The thermometer ranges from 70° to 85° and even down as low as 66° in the cool nights in January.

The general character of the country has been described by one whose means of inspection have been considerable, and whose geological attainments constitute him a competent judge, thus,

" The elevated parts of the Straits Settlements are composed either of plutonic (principally granitic) rocks, or stratified clays, shales and sandstone, varying in their texture and composition, and frequently impregnated with iron. The Island of Pinang is one granitic mass, which changes its mineralogical, and consequently its agricultural, character as we proceed from the north to the south. From the surface of the channel and of Province Wellesley many low hillocks and ranges rise, some of which are granitic and others sedimentary. Malacca (including Naning) and Singapore consist of groups and ranges of hills, amongst which long and narrow vallies ramify. Granite and allied plutonic rocks are largely developed, forming extensive tracts in the Malacca territory, and, contrary to the opinion that has generally prevailed, composing the larger part of Singapore. The plutonic action which the sedimentary rocks have undergone in a greater or less degree has, in many places, veined and impregnated them with iron, and sometimes so largely as to give them a completely iron-masked or lateritic character, a circumstance very necessary to be remarked in an agricultural point of view.

" The vallies and plains are for the most part alluvial and consist chiefly of clay. Amongst this sand appears, occasionally forming bands of some breadth, but more often extending in long narrow

zones raised a little above the level of the clayey flats. Where swamps have been formed by such sand belts banking in the water, vegetable matter has been accumulated. Its depth is regulated by the level which the clay or sand flat that has been banked in had previously attained, and in different localities varies greatly. Where new, it consists of fragments of wood and masses of acquatic plants more or less decomposed, and, where old, of a soft black peaty matter, spongy and elastic at the surface, and below passing into a thick vegetable mud."

From which description it will be inferred that the soil is generally good, which will be readily admitted on seeing the gigantic trees and the thick underwood of which the interminable forests are composed of along the whole coasts from Johore to Province Wellesley, a distance of upward of four hundred miles.

Until very recently Europeans had done little in plantations of any kind. In the early part of the present century the high prices which spices bore induced several Europeans to commence the cultivation of pepper, nutmegs and cloves on the island of Pinang then recently ceded to the East India Company and made a principal place of stoppage for their ships trading to China. But subsequently a long period of uninterrupted peace induced larger productions of these products and consequently lowered their value, which, together with the very high pretensions of the Company for the occupation of the waste lands, deterred enterprising Europeans from applying for them. But after some years a modification of the terms, with the prospect of a diminution of duties on sugar, led to the establishment of considerable Sugar plantations in Singapore and Province Wellesley under European management. The boon obtained by the last named place in having her Sugar and Rum imported into the home markets on payment of the reduced duties encouraged the extension of cultivation there, whilst the denial of the same advantage to Sinpore at once checked any further efforts in Sugar cultivation.

So recently as 1843 the official reports of Pinang show that only,

cwt. qrs. lbs.

353 3 10 of Sugar and 4,000 gals. of Rum were exported,

Whilst the records of the same office exhibit the following subsequent reports of exports, viz.,

1846 from 1st July to 31st Dec. 13,000 piculs Sugar, 10,040 gals. Rum
1847 from 1st July to 30th June 28,500 piculs Sugar, 13,000 gals. Rum

and from 1st July to 31st Dec. the exports were estimated to be

35,200 piculs Sugar
59,000 gals. Rum.

In the course of a very few years the exports will probably rise to about 100,000 piculs, when, as all the territory under the jurisdiction of the East India Company will have been taken up and under cultivation, no more ground will be available unless a further cession of territory should be asked for by the Indian Government and ceded to them by the chiefs of the adjoining native states.

In the meanwhile nutmeg, cocoanut and rice cultivation have been on the increase on the island of Pinang and in the Province, which, with the returns of the cane lands, have made of George Town, so recently wearing the internal signs of decay, a bustling and flourishing mart.

The natural fertility of the soil in Province Wellesley, which generally is level and little raised above the adjacent sea, assisted by abundance of fish, bat-guano and other manures, of which the Chinese avail largely, cause large returns from the land, amounting in some instances to three tons of raw sugar or gour per acre. The cultivation of the cane is generally carried on by Chinese who yearly emigrate in large numbers, from Amoy chiefly, and who let themselves out for one year to Europeans or to Chinese cane growers, at from three to four Spanish Dollars per month, they finding themselves in food, clothes &c. The Chinese, for the most part, manufacture a coarse quality of sugar, called Jaggery, but they generally prefer to contract with Europeans who have mills and apparatus for manufacturing sugar and rum, to deliver to them their canes at from one and a quarter to one and a half Spanish Dollars per picul of the gour made therefrom. As planted canes are from twelve to fourteen months before they are ripe and ratoons from ten to eleven in the Straits, the planter gathers two full crops in two years. Many labourers come also from the Madras side of India, who let them-

selves out on the estates and are more prised for various kinds of plantation works than as cane cultivators.

Both in Province Wellesley and at Singapore sugar is manufactured by Europeans after the West India process. Almost every estate is provided with steam or water power to express the cane, and the juice is concentrated in coppers of various forms placed in ranges under which the dried expressed canes are used as fuel. Rum is also made as in the West Indies.

Neither the plough, the harrow, nor any other agricultural helps are in general use; the hoe being the only implement of husbandry employed by Chinese, or Malay or Kling coolies in the Straits, with the exception only of one estate where European implements are used,—and hence the great number of labourers employed on a comparatively small extent of canes. Two and a half acres is the most that a Chinaman cultivates in the year, and even this little is only obtained by hard driving, if working on monthly wages for a European. The returns from which would be about forty piculs of dry sugar, whilst in Louisiana, in the United States, where implements of husbandry adapted to this culture are freely used and notwithstanding the immatured condition of the canes when cut,—which, owing to the cold season are obliged to be manipulated before they are ten months old,—each hand, or labourer on the estate, men, women and children, able to work, produces from five to seven Hhds. of Sugar of about one thousand pounds each, according to the returns made to and published by the Congress. A quantity truly enormous considering that from twenty five to thirty per cent of the labourers on a sugar plantation are either idlers so called (persons employed at various works out of the fields) or disabled by sickness. But the contrast between Louisiana and Java, in the extent of production according to the number of labourers, is still greater than here, for, according to "Temminck's General view of the Dutch Possessions in the Indian Archipelago," not less than 2,440 men are variously employed in producing a crop of 6,000 piculs of Sugar on an estate of 400 Bahus or Bouws, which is about equal to an English acre. The same writer states the price of field labour at $\frac{12}{100}$ of a Dutch florin,

equal to one cent and a half of a dollar per day and not found.

This immense economy of manual labour in Louisiana shews but too clearly the advantage to be obtained in the use of suitable helps and implements. Sixty stout mules, thirteen ploughs, and about a hundred and fifty hands, or slaves, suffices for the cultivation of six-hundred acres of canes and two hundred of Indian corn, besides cutting a sufficiency of wood for the steam engine and range of concentrating coppers. But manuel labor is not wasted there as in most of the sugar growing countries, particularly on this side of the Cape of Good Hope. There, the drills or furrows are opened with ploughs, there the grasses and weeds are extirpated by the same implements or by harrows, there the banking of the canes so slow in turning up, and so expensive in making here, is done with a subsoil plough, which not only throws up a bank for the present purpose but brings up to the surface, there to remain exposed to the influence of the atmosphere for some months, a fresh body of earth held in readiness for the next crop. With these appliances, and with thorough drainage where needed, it is that the Louisiana planters obtain from unripe canes, in a season of nine or ten months, more than double the quantity of sugar from a given extent of ground than in any place within the tropics.

The cultivation of the land as a business, except in raising paddy or rice, cannot be said to exist at Malacca. Nothing indicates that the Portuguese or the Dutch paid any attention to the soil, for there remains no vestige of any attempt at cultivation. And yet there is under British jurisdiction one thousand square miles of land well adapted to almost every description of tropical crops, and which almost wholly remains in a state of nature. Around the town of Malacca for a few miles are extensive paddy fields planted chiefly by Malays, but elsewhere not a plantation is to be found. The Chinese, natives of the place, who resort to Singapore in search of fortune and who as merchants, shopkeepers, and brokers, are the life of that commercial town, after a successful career return, whilst yet under middle age, to their *Elysium*, their beloved Malacca, to pass the remainder of their lives. But here they are as inactive

as they were stirring at Singapore, and instead of seeking occupation by investing a portion of their wealth in rearing plantations of Spices, Sugar, Paddy or any thing else (for there is at present no commerce in the place,) they build splendid dwellings in a close and crowded district of the town, and in an impure atmosphere the remainder of their days are passed without following any serious occupation. Such is Malacca at this day, in an agricultural point of view.

The hard conditions formerly imposed by the East India Company on their tenants, as has already been stated in the first part of this paper, kept back European enterprise at Singapore as at the other end of the Straits. But however a few Europeans and many Chinese ventured to make settlements in the interior of the Island, hoping for a more liberal policy.

The Chinese undertook the growth of Gambier and Pepper, and gradually have extended themselves over a considerable portion of the Island. But they are evil doers rather than doers of good to the land, which after a few years cultivation they abandon, empoverished and overrun with lalang grass, and remove to a fresh clearing in the jungle, where the virgin soil becomes in its turn exhausted and a nuisance.

The emigrants from China who yearly arrive here are of the very lowest classes of labourers in their own country, and for the most part enter into engagements with their countrymen already established here to labour for one year, in consideration of the payment of their passage money hither. At the end of the year, if perchance they have not quietly emancipated themselves before, they are free to do as they please, and as they are mostly taken up by the Gambier and Pepper planters they usually bargain with a Chinese shopkeeper in Singapore for money and provisions to enable them to set up with, pledging the future plantation and its products on conditions highly favorable to the capitalist. After having found a suitable location they squat upon it, not unfrequently without even applying for a license or cutting paper from the local authorities, a clearing is soon made in the forest, a part is planted in gambier and a part in pepper, the fallen trees being preserved for future use in boiling the

the leaves of gambier into a strong decoetion which on cooling hardens somewhat in appearance to soap. Now the Pepper vine, to be vigorous, and productive, requiries a good deal of manure, and the exhausted leaves of Gambier are carefully preserved to be afterwards deposited at the roots of the pepper vines, and this is the only manure they receive, while to the Gambier plants none whatever is given. The ground is gradually impoverished; becomes less valuable; *lalang* soon begins to shew itself among the plants; as the cultivator is not the proprietor, but a squatter, and as he has abundance of fresh ground at hand, and believing it to be more for his interest to begin a new plantation than to be at the expence of procuring manure to keep the old one in good order, it is not a matter of wonder that he should remove from place to place, and, as the locust, leave a tract of desolation behind him.

The Europeans who commenced plantation of nutmegs, cocoanuts and Sugar canes have been put to great expence in extirpating the lalang left by the Chinese who preceded them, and as their pernicious practice is still continued, the heavy out-lays required to put the ground in a fit state for planting will tend to discourage and retard European enterprise.

There are several extensive estates of nutmegs owned by Europeans in tne Island in a very thriving condition, and more are yearly added. This spice grows best in the red soil of the hills, and to increase the products large quantities of rich manures are given to them, once in two or three years.

The great attention the trees receive in the Straits has a very beneficial effect on the nuts, which are large and of a much esteemed quality in the markets of the west.

No success has attended repeated trials of cloves here; until the trees reach the age of bearing they grow and look extremely well; but any expectation of a crop that may have been raised by their hitherto fine condition ends in dissappointment, for just then the trees assume the appearance of sudden blight as if lightning stricken, and they die.

Cinnamon is much more successful, for wherever planted it grows

most luxuriously, but as no one has yet made a business of preparing it for the market its quality remains unknown.

The article which, next to nutmegs, has arrested the attention of Europeans is the cocoanut tree, of which there are many extensive plantations in a very flourishing condition, holding out favourable prospects to the proprietors. Hitherto the Island has been supplied almost wholly from abroad with nuts and oil for its consumption which will before long be obtained from her own soil.

Sugar cultivation was commenced on the island ten years ago and has remained stationary since, for the two plantations then commenced remain still the only ones. The cause of this pause may be mainly attributed to the higher rate of duty charged in Great Britain on the Singapore grown sugar than on that manufactured in other British Colonies, and this heavy difference is imposed because foreign sugar, like every other article of commerce, is freely admitted into the port; as if it could not easily be ascertained and certified by the local authorities of the place which is the genuine production of the island. Another cause for its non progress is the want of adequate capital to carry on the business on a large scale. From the beginning an impression has prevailed that neither the climate nor the soil were favourable to the cane, consequently no money facilities are obtainable in the shape of advances on growing crops or time loans. But to those acquainted with the matter the objections alledged will appear to be mere prejudice unsupported by facts, for if, in taking note of the climate, neither long protracted droughts, nor continuous seasons of wet are heard of, nor hurricanes, nor typhons, and if a soil changing from red clay more or less mixed with sand, to fields of peat overlaying beds of blue clay filled with marine shells of various sorts be observed, if the observer does not class this soil as the very best, he will be apt to pronounce it, at least, good; more particularly if, on proceeding with his observations, he sees continuous fields of canes measuring from six to eight feet in the stem; which when ripe and expressed yield a fair quantity of juice marking from 9° to 11° of Baumes Saccharometer. A practical observer will not be apt to issue a decree of condemnation against the cultivation when, besides,

he ascertains that the natural circumstances of the country allow of the taking of two full crops in two years: viz., one of planted canes in fourteen months, and one of rattoons in ten months; and neither the quality of the Sugar or Rum obtained from the canes will lessen the favorable opinion he may have formed; for the sugar he will observe in the London price current classed with that from Jamaica and obtaining in that market the same price, and the Rum his own judgment will place on an equality with that from the above named island, and no doubt would be equally valued in the home market if its sale for consumption there was allowed. But the foreign duty is charged on it which amounts to a prohibition. Singapore being thus circumstanced it ought not to appear extraordinary that sugar cultivation has not been progressive.

Although Indigo is extensively used by the dyers of cotton fabrics here yet it is little cultivated in the island, where it might be produced extensively, for the seeds thrive luxuriantly and abundantly wherever sown. Three crops have been reaped in a small experimental field sown with Bengal seeds, and probably, with more attention than the experiment received, four cuttings might have been had in the year.

Singapore is celebrated for the great abundance and excellence of its pineapples which may be obtained during nearly the whole year, and from which, if the accounts published from time to time of the value of the silky thread obtained from the leaves are to be depended upon, a valuable article of export might be gathered.* The small circumjacent Islands, are quite covered with fields of this plant; the fruit only is of any value to the Chinese cultivators, whilst hundreds of tons of the leaves are annually allowed to waste by slow decay on the ground.

Some notice has already appeared in the Journal of Gutta Percha† a new product from the Straits, which has attracted much attention and which daily becomes an article of greater commercial value.

* A small quantity is annually prepared and exported to China, as we accidentally discovered some time ago. Some notes which we made on the subject will be given in the Journal.—ED. J. I. A.

† *Ante* vol. I. p. 22, 261.

The forests of Singapore have been pretty well cleared of the tree which the Malays cut down in order to come at the milky substance which, when boiled in water, turns into this solid substance, and the same imprudent and reckless people are now ransacking the woods of the Peninsula with every prospect of destroying the last remnant of the tree before long.*

Many specimens of other products of intertropical regions are to be seen in a thriving condition in the Straits, leading to the conclusion that if attended to on a large scale, adequate qualities would be obtained. Coffee alone is said not to be remunerative, owing, as is alleged, to the wetness of the climate which keeps the tree in a bearing condition all the year round, thereby decreasing its productiveness. It is certainly true that the trees yield fruit with very short intermissions throughout the year, but how far this objection is valid is not so clear as the same objection might be made to nutmeg trees, which also are in constant bearing but nevertheless yield abundantly. It remains yet to be seen, what has not yet been tried in the Straits, whether the cultivation of coffee under the conditions required in other countries, viz: in rich virgin hilly soil and protected by the foliage of larger trees from the burning rays of a vertical sun will not give, more especially in the interior of Malacca, the returns usually obtained from the plant in other places.† The few trees planted here and there produce beautiful small blue beans, the quality the most in favour in commerce, which makes it to be regreted that as yet no serious and well directed attempt has been made to cultivate it extensively.

Sanguine expectations were at one time entertained of raising

* But see the remarks *ante* vol I. p. 263. - Ed.

† An experiment of the kind was made in Penang, and so long as the constant attention which such experiments require could be given, it was quite successful. The ultimate result is still uncertain. We hope that our local readers will favour us with accounts of all such experiments. There is not a cultivated plant in the Straits of which the habits and culture have been fully described, and no contributions would be more interesting and useful than accounts of these. We are promised papers on the nutmeg and cocoanut, and we hope all our other cultivated trees and plants will be successively described by gentlemen who have given their attention to them.—Ed.

cotton on the island and considerable expence was incurred in giving it a fair trial. But the magnificent reports of coming crops sent to the Agricultural Society of Bengal, and the cheering reports of the London brokers to whom trifling samples had been sent, were doomed to a short life, for although the cotton plants of almost every known species were tried, and grew well, still they yielded but few pods and these were for the most part mildewed and consequently not merchantable.* The fact is the climate is too damp generally for maturing a fibrous and delicate substance, requiring continuous dry and hot weather.

But as has been already observed, agriculture has scarcely been introduced in the Straits. What little is done in planting is done without reference to art or science. The hoe is the implement in universal use, slow and expensive, whilst the rapid and economical plough is wholly overlooked. Neither is the composition of manures attended to. But wherever fish, or bat-guano, or a dead horse or an old cow is to be readily got, it is carted to the field and immediately applied as a fertiliser without admixture and decomposition with other nourishing substances, by which the quantity would be increased a hundred fold.

The time is, however, fast approaching when enterprise and skill will reach the Straits. Its fertile soil, its rich and abundant tin and gold, its fine rivers opening extensive and frequent communication with the interior, the facility of obtaining cheap labor from India and China, and above all its temperate and very healthful climate will invite settlers, who, undertaking agriculture as a business, will avail themselves of the improvements of the day, and not let them remain as now, a dead letter.

* A full account of this attempt to introduce cotton would be highly valuable. All such experiments, whether successful or unsuccessful, have a permanent importance, not only for the Settlements, but for the extensive adjacent countries which partake in similar general conditions of climate. —Ed.

RECENT SCIENTIFIC RESEARCHES ON THE ISLANDS OF BALI AND LOMBOK.

THE 21st Volume of the Transactions of the Batavian Society of Arts and Sciences, which we received by the February Steamer, contains a highly interesting report upon the operations of the Society by its learned and indefatigable President Dr. W. R. Baron Van Hoëvell, which was read at the last general meeting. As we cannot at present make room for the whole, we translate the portion which relates to the means taken by the Society to avail itself of the late expedition to Bali for the attainment of a more accurate and complete knowledge of that remarkable island.

When the report began to be confirmed that an expedition against the King of B'líling, on the Island of Bálí, was about to be undertaken, the attention of the Direction of the Batavian Society of Arts and Sciences was strongly attracted to that Island so important in relation to the philology of this Archipelago, and it appeared to them that it would lead to results of great value to science if this opportunity was seized to make antiquarian, historical, ethnological and linguistic investigations. In consequence of this the President of the Direction waited on his Excellency the Minister of State, Governor General of Netherlands India, with the following address.

Batavia 29th. February 1846.

We find amongst the natives of the Archipelago over whom the Netherlands has exercised sovereign authority for about two centuries and a half, four different civilizations, viz.,

1st. An original Polynesian or Malayan;

2nd. A Hindu civilization which followed on the Malayan, but which has so united itself with the more polished nations of these Islands (above all the proper Malay and Javanese) that, in language, manners, usages, letters and remains of religion, they bear a general clearly recognizable Hindu character.

3rd. An Arabian Mahomedan civilization, which however, ex-

cept in the forms of religion, has made very little change; and the principles of which, having been little imbibed by the people, are in language, faith, customs and letters, plainly recognized as foreign mixtures;

4th. A Christian civilization which, thus far, only shews some traces amongst those people of the Archipelago to whom Hinduism and Islamism had not at all or only slightly penetrated.

As therefore the Hindu civilization is the only one which has deeply imbued the character of the nations of these islands, it needs not to be demonstrated that, in order to learn the people thoroughly, we must make ourselves acquainted with the nature of the religions, and civil opinions, which, proceeding from the continent of India, (Hindoostan and the Dekhan) have changed the life and mode of thinking of the islanders. But we must also ascertain what changes the original Hindu principles have undergone through the peculiar character of the islanders themselves; what modifications in that respect have had place.

As a means of assistance towards the acquisition of this knowledge, we possess on Java an ancient sacred language, the Káwí, through the writings in which all that I have shewn above can be illustrated in whole or in part. But no one, whether amongst natives or European scholars, possesses, thus far, the key to this language. Again, many writings, particularly upon the ancient religion, are, through the intolerance of Islamism, nowhere to be looked for on Java itself. We even derive little light and illustration from the ruins of temples, from the images here and there scattered about or dug up from the ground, and from all that remains preserved from the ancient time.

It is now however a fact generally known that on the Island of Báli the Hindu religion subsists undisturbed and alone in the whole Archipelago, and in her two great capital forms, the Brahmanical, the original, and the Buddhist (following the conclusion of the greatest scholars) the reformed form.

This phenomenon is one of the most remarkable that European curiosity and ingenuity can select in the east as the object of their

researches. Every one who has made acquaintance, however superficially, with the principal religions of civilized Asia knows that Budhism was excluded by Brahmanism, and in a war, which endured for ages and desolated great regions, was exterminated by the Brahminical worshipers. It is thus highly important for science to enquire how the two religions, without destroying each other, subsist peaceably under the same government, are governed according to the same laws, and have known to remain free from Máhamadan supremacy. For if we supposed a hostile relation between the professors of the two Indian religions on Bálí, the Máhamadans would undoubtedly have made use of this animosity in order to carry through their schemes of conquest, as they have done in all the neighbouring islands.

Already therefore, viewed by itself, is this phenomenon of the highest importance; but it acquires still greater value from the conclusions which may be drawn from it for Java, where each sort (Buddhism with Brahmanism) had existed, and where in earlier ages the Hindu religion attained such a high grade of civilization that the evidences of it which the magnificent ruins in trachite, and the excellent old writings, present, justly fill us with wonder and surprise.

Two meritorious men who have so much forwarded the study of this Archipelago in general, have also furnished to the European public the first scientific accounts of Bálí. Raffles and Crawfurd were on that island, and have communicated to us all that they themselves saw, or heard from others, concerning the land, people, religion, language and literature. But however excellent their labours were, we know they can yet in no single particular be considered as satisfactory. We cannot however accord sufficient gratitude to Raffles, who was almost unacquainted with the languages of the Archipelago, for the unwearied diligence and care with which he collected materials for a knowledge of them. We recognize in Crawfurd's paper on Hinduism on Bálí (As. Reser. Vol 13. p. 128 and 199, Calcutta 1820, Indian Archipelago Vol. 2.) the endeavours of a scholar, proceeding to explore a new field of research cautiously but with great strides, and to seek truth without prejudice or regard for opi-

nions once entertained. But to the labour of both these writers the compass was wanting which alone can give us a true idea of the condition of Bálí. Crawfurd was only at B'liling, and had never seen the places where we are assured that pure Buddhism exists. He did not penetrate into the interior, while we know from the accounts of a Mahomedan, Abdullah* (Tijdschrift voor N. I. 7th. year 2nd. part p. 160,) and of other travellers, that in the interior, temples and images of gods exist, whose presence, Crawfurd, following what he had seen, denied. We want, besides, the writings of the Balinese, of which Crawfurd and Raffles only give some titles, and that without the requisite carefulness. The titles are, as W. Von Humboldt shews, Sanscrit. We want a carefully prepared account of arts and trades, of the state of cultivation, in short, of all that marks the condition of a nation.

W. Von Humboldt has spread much light over Bálí. This profound philologist has out of the above named not always clear springs alone, drawn with astonishing erudition and ingenuity, principally through the resemblance of the languages of the Archipelago to the Sanscrit, a number of conclusions, and made very probable conjectures, which must be tried on the spot, to enable us to receive them as sure truths.

It is therefore the task of the advancers of science in these parts, to undertake those researches which, from his great distance and the poverty of materials, the great Von Humboldt could only defectively engage in. Not only must the phenomena of the present time be exhibited, not only must all possible light be collected on the past time from the mouths of the civilized inhabitants, but above all it is necessary that all Káwí and other manuscripts which can be heard of should be collected, because these are of the utmost importance for the illustration of the social and religious condition not alone of Bálí itself, but also of the still more important ancient Java.

As I have said above, Raffles and Crawfurd have enumerated a ve-

* We have made a translation of this curious and in many respects instructive Malayan history of Bálí which will appear in this Journal.—Ed. J. I. A.

ry great number of such Káwí writings which, to judge from the titles, must relate to the religious opinions of the people. On Java there has hitherto, so far as I know, only been met with Káwí translations or paraphrases of the Indian heroic poems, the Ramayana and Mahabaratha. Through that however which we may expect from Bálí this literature may become a whole, and we may hope to be placed in the possession of all that the Hindus have imported into the islands, and at the same time to trace the changes which the Hindu element has undergone on Java and on the other islands, particularly also the supposed mixture of Brahmanism and Buddhism.

On all these grounds I count to make my suit with effect to your Excellency on the necessity, for the literary reputation of the Dutch nation, that in the approaching expedition against the King of Bliling, which I understand will be ere long undertaken, the interests of science be represented. As I above had the honor to represent to your Excellency the eyes of all the philologists in Europe are fixed upon Bálí. From that island they anticipate a new light on the history of the Archipelago. The Batavian Society of Arts and Sciences desires therefore to join to the expedition an emissary of science with the following mission.

1st. To collect all Káwí and Bálinese writings upon myths, religions, laws, history, arts, &c. also all inscriptions on stone, copper, &c.

2nd. To bring over as many as possible of the images that may be found to the Cabinet of the Batavian Society, or, as this may be attended with too much difficulty, to note the peculiarities of these images, their agreement with and dissimilarity from the known Javanese images, and to collect all legends and traditions concerning the images which may be found in the mouths of the people, principally the Brahmans.

3rd. To learn the present ritual, in the worship of the gods, feasts, &c., and to seek for writings which are composed thereon, noting which belong to the Brahmans alone, and which to the whole people.

4th. To enable us to compare the style and architecture of the

temples and religious and other principal buildings, through delineations and notes, with those which are found on Java and in India.

5th, To enquire if the Káwí is still used and how old the existing writings are. Above all, also, whether the Káwi came to Bálí from Java or immediately from India.

6th. If possible to engage a learned Brahman for the Batavian Society, and to bring him over here.

If this mission shall be carried through it will spread a great light over the still little known Hinduism that existed on Java prior to Islamism, and, finally, a language which clearly belongs to the foundation of all philological researches into the Polynesian languages will be drawn out of an undeserved darkness, and given over to science which so long has desired to receive it within her circle.

To give the necessary orders to ensure Mr. Freiderich being placed, as much as circumstances will permit, in a position to make all the researches on Bali that concern his mission; and that the collection of writings, inscriptions, images &c., which Mr. Freiderich shall make in Bali may be conveyed to Batavia on board one of the ships of the expedition.

The President of the Batavian
Society of Arts and Sciences,
Dr. W. R. Van Hoevell.

As was to be anticipated from the Governor General's enlightened spirit and desire for the advancement of science and art, the proposition met with the approval of his excellency, so that already by decree of the 28th. February following what was desired in the above address was ordered.

(The preamble of the decree incorporates a considerable portion of Dr. Hoevell's address, and proceeds as follows.).

It is found good and thought fit,

1st. To make known to the Direction of the Batavian Society of Arts and Sciences that R. Freiderich is permitted to accompany the expedition which is presently to proceed to Bálí, provided he will in every thing conduct himself with subordination, and that on his ac-

count nothing be done or omitted inconsistently with the necessities of the expedition,—he addressing himself to the Marine Department to provide for his passage hence and back.

2ndly. The Society in the burden of this mission somewhat to assist &c.

3rdly. To desire the Government Commissioner for Bálí J. F. T. Maijor with reference to the resolution of Art. 1. hereof, to afford Mr. Freiderich, as far as circumstances will permit, opportunities to make those explorations on Báli which his mission shall require, with the provision that the collection of writings, inscriptions, images, &c., which he may make on Báli shall be forwarded to Batavia in one of the ships of the expedition; the Minister of State, Governor General, reserving to himself to appoint the more particular disposal of the remarkable objects collected, which cannot be done *a priori*.

4thly. To make known to the Direction of the before named Society that the Minister of State, Governor General, will expect a circumstantial report of the results of the mission of Mr. Freiderich.

Mr. Freiderich departed on the 26th. May, on board H. M. Schooner *Circe*, Lieut. 1st class Klinkert, which vessel came to anchor before B'liling on the 27th June following. After the important engagement between our sea and land force and the troops of the King of B'liling had taken place which resulted in the Kampong of that name being conquered and given to the flames, and the destruction on the following day of the seat of the Raja himself, Singa Raja, the opportunity for scientific researches began. In the plundering and sacking some complete Bálinese MSS., but mostly Arabian and Malay were found. They are chiefly written in the latter languages, because the Kampong B'liling, is principally inhabited by Linganese and Bugís and some Chinese and Arabs. Mr. Zollinger, who is charged by the Government with a scientific mission to Lombok and the islands lying further eastward of Java, being accidentally with the expedition against B'liling, was present at the destruction of this Kampong and Singa Raja. He saved many MSS.

and objects of scientific importance which he succeeded in collecting with much labour, danger and ingenuity.

On the 1st of July Mr. Freiderich went on shore; he found, the first evening, among the ruins of B'liling a number of loose leaves, partly letters; on the following day he accompanied the troops on an expedition to Singa Raja where he collected five complete Bálínese MSS., and some wooden and stone images. The different excursions which he made in the neighbourhood during his sojourn at B'liling, were of great use to science from his collection of ethnological objects. But seeing, according to the assurances of those best informed, that B'líling must not be the only place of his enquiries, but that they must embrace Klongkong and Badong, and also Tabanan, Mr. Freiderich has since proceeded to Badong when he prosecutes his studies. In the Tjidschrift voor Neerlands Indie I have from time to time communicated some notices of the results that have been obtained, to which I take the liberty of referring you. The Direction has now anew received communications of the greatest importance from Mr. Freiderich, the particulars of which I shall shortly give to the public by the same channel. They contain new contributions respecting the Káwí literature; some weighty remarks on the castes; elaborate accounts of religion on Bálí; and an offer to work all the materials that have been collected into a "Treatise on Bálí". As you have already heard, the Direction has willingly accepted this proposal, and this work of Mr. Freiderich will form one of the contributions of which the 22d part of the transactions of the Society will be composed. The plan of this treatise will be entirely based on the form and method of the celebrated work of Professor Lassen "Indische Alterthumskunde." It will consist of nine divisions. I. a geographical view of Bálí. II. A sketch of the history of Bálí. III. The history of the religion of Bálí in connection with that of Java. IV. On religious worship in Bálí. V. On Buddhism in Bálí. VI. On the languages of Bálí. VII. Káwí literature. VIII. Bálí literature. IX. Arts in Bali. X. Government of Bálí. XI. Domestic system and life.

When this work shall have been completed Mr. Freiderich intends

to publish some of the principal pieces of Káwí literature on Báli, and to begin with the *Ramayana* and the *Parvas*.

Every one who with us deplores the loss of the knowledge of a language which formed itself in earlier ages on Java, and in which the fullness of pure Sanskrit was interwoven with the language of the inhabitants; in which the celebrated ancient literature of the continent of India was appropriated by the genius and the skill of the hinduised Javanese, wrought in the national mould, and adorned with new beauties; in which the inhabitants of the island, when they had, after the lapse of some ages, been elevated by Indian civilization and development, impressively imaged and characterised themselves; every one, who places all this before his mind, will rejoice with us in the results of this undertaking that have already been attained. Arid Islam has on Java expelled and destroyed the literary and poetical life of India, but on Bálí we find the key that will enable us to penetrate the knowledge of this life as it once animated the Javanese. May then these researches be further crowned with a rich harvest in furthering the knowledge of the Archipelago, to the benefit of science and the renown of Netherlands.

NOTICES OF LOMBOK.

Defective as our knowledge of Bali has hitherto been, of the adjacent island of Lombok we knew still less. Indeed we are not aware that any notice of it existed prior to the recent visit of Mr. Zollinger, with the exception of some very slight notes extracted from a jonrnal, which were presented to the Asiatic Society in 1846. As these notes we believe have not been otherwise published we subjoin them.

10th. December 1844.

In July last a ship from the port of Ampánán in the Island of Lombok called " Todáh" (sword fish,) belonging to a Bugis settled there named Nákhodá Mudá, when about to clear out from Singaporc was claimed by one Hájí I'sáháh as his property. An action was commenced in the court; and, as the Nákhodá had no bill of sale of the vessel, it became necessary to procure evidence from Rhio, where the former owner of the vessel, Rájá Husain, resides, and from Lombok. The Nákhoda's statement was that the vessel had been sold by Rájá Husain to Nákhodá Ishmailá the elder brother of Hájí Isáháh, and that on the death of Ishmáilá, or Smylá, as he is called, at Lombok (where he had been long settled) without leaving any male offspring, his wife, daughter, slaves and all his property became the king's,—that the king made over the whole to Nákhodá Mudá, on condition of his supporting and protecting the widow, daughter and dependants of the deceased. Hájí Sáhah (Isáháh) asserted that he had purchased the vessel from Rájá Husain, but it was probable that if he failed to prove this he would claim it as administrator to his brother's estate, as he had obtained letters of administration from the court last year. The rule being that personal property descends according to the law of the place where the owner was domiciled when he died, it became necessary to obtain evidence of the law of Lombok on this point. It happens that Mr. King, an Englishman, is Sabandar at Ampánán (or *Mataram* as it is termed in official language) in that island, and to him application was made for information.

About a week ago Nákhodá Mŭda arrived here in person bringing a letter and certificates from Mr. King, a declaration in Malay under the seals of the Raja and his son, the same in Balinese, and,—what I value as more curious than all the rest—an extract from the written code of civil laws or *Dígámá* of Lombok, certified by the two *Edá Gédé's* or chief Brahmans, who are the depositories of law and the highest judges of the kingdom. I have always regarded Bálí and Lombok (the two first in the remarkable chain of Islands stretching eastward from Java to New Holland) with great interest, for there to this day what may be called the ancient history of the Malayan Archipelago is repeated, the ancient life is seen in full activity. Elsewhere Hinduism is extinct as a principle of faith and action, having been supplanted by Islamism, and is only to be traced, though largely, in the languages—of which some have more words of Sanscrit origin than of the old Malayan stock, and all more than of the modern Arabic engraftments,—in architectural remains (abundant in Java and scanty elsewhere) and in traditions, customs and literature. In Bálí and Lombok Hindu princes still reign. Castes are as distinctly, perhaps more distinctly marked than in India; the sacred Brahmans minister in the temples and expound the laws. It is as if instead of a mere dead material Pompeii disentombed, we had the religion, laws, language and manners of ancient Italy preserved in full life in Sicily. Of Bali we may read in Raffles' Java, Crawfurd's Indian Archipelago and other works. Of Lombok neither there nor elsewhere could I ever get any information. I was therefore well pleased when a door was thus opened through which I might obtain some insight into its condition. I have not, after all, been able to obtain any full or precise information. Of what little I gathered I shall note a few particulars.

The two writings in the Bálínese character are scratched with knives on *lontar* leaves, and this is the material on which their ancient laws are preserved, and which, to this day, is exclusively used in all their writings. In Java the palm leaf has long been superseded by paper.

The proper name of the island is *Selápáran*. The Bugis call it

Sássák. Lombok is the name of the southern portion, but has been extended by Europeans to the whole island.

An abstract translation of the certificate of the Brahmans made by Mr. King is as follows. " This is to certify that according to the received law of Selápáran that has been in force under former Rájás and is now continued in use by *Nurah Katat Carrang Assam*, should a foreigner request to become an inhabitant of Selápáran, at the will of the Rájá he is permitted, on the condition of his observing the laws and regulations of the island; according to which laws if an inhabitant, whether native born or an adopted citizen, is without male issue he becomes " *Champutan*," although he may at the same time have female children, and in case of his death, his family and all and every his effects revert to the Rájá, to be disposed of according to his pleasure. This is the law in use in Seláparan from heretofore and now in force according to the written code. This is an extract from the said code, ' an inhabitant of the land dying without leaving male children, all his estate reverts to the Rájá of the land or is lost to the family as goods thrown in a well.' We judges of the court of Selápáran *Edá Gédé* (high priest) *Made Wangean* and *Edá Gédé Wayan Intaran* declare to all to whom this may come that the above extract from the code of Selápáran as aforementioned is a true extract from the code, that we have added nothing nor omitted any thing in the said extract. Dated the day of *Sanis Chara Kalewon Warra Cooningan* 5th month 8th day of the moon 6 Rah of the 6 Tunguck of 1766 Esaka (signed) *I Edá Gédé Wayan Intaran* (L. S.) *I Edá Gédé Made Wangean* (L. S.) written at *Mataram* in the island *Selápáran*."

The mass of the population, unlike that of Bálí, is Mahomedan. According to my informant, the planting of the Hindu standard in Sassak is a comparatively modern event. In Bálí there are several sovereignties. A disputed succession to the throne of one of these, opposite Ampánán, *Karang Assam*, led to the withdrawel of one of the claimants with his followers to Sassak, where he founded the Hindu dominion to which it has since remained subject.*

* Other accounts are to the effect that the state of Karang Assam being

The Rájás still assert their right to the throne of Karang Assam by adding its name to their royal title. The higher officers of state are called *Gusti*. The most numerous grade of officers are the *Pámbakals* (heads of villages) who rank according to the number of persons under their jurisdiction, thus there are pambakals of 1,000, of 500 &c., The high court is composed of 12 Brahmans. Any person who has a complaint goes to whatever advocate he chooses, who reduces it to writing. The defendant puts in his defence in the same mode. The evidence of the witnesses is also written.* The whole case being thus stated, the court meets and discusses it. Their opinion is then recorded and carried up to the Rájá. If he approves of it, it becomes the judgment.

The country behind Mataram is a plain of very rich soil laid out in paddy fields which are irrigated by water conducted from deep and large lakes in the mountains. The produce is abundant. Rice is measured by the kuda (i. e. horse) or horseload of 3 piculs. The Rájá receives 150 out of every 800 *ikats* or sheaves of paddy. Every householder or head of a family pays annually a tax of 2 dollars. Land is measured by the *tunnah* (not *tanah* as it has been written) which Nákhodá Muda says is a definite measure, and not a term to express land, greater or smaller according to its fertility, yielding a certain quantity of produce,—a definition which I have seen somewhere.

Widows frequently burn themselves on the funeral pires of their husbands, but no conpulsion whatever is used towards them.

In Sassak, as in Celebes, very few dollars are in use, the current coin being small copper pieces, so that to make a payment of no

at war with that of B'liling, the latter gained the mastery; but the Raja having afterwards been deserted by his subjects and delivered into the hands of the Raja of Karrang Assam, the latter, after putting him to death, was emboldened to attempt the invasion of B'liling in order to procure human bones to build a temple in fulfilment of a vow. This led to his being abandoned by the great body of his subjects, and his subsequent ferocity in offering up a human sacrifice to propitiate the gods having excited their horror and detestation, he fled with his followers to Sassak and founded the Hindu dynasty of that island.

* According to Mr. Zollinger the pleadings are all written impromtu at the hearing (or rather reading) of the cause, not a word being spoken by either party from first to last. *Tijd. voor Neerland Indie.*

great amount the services of half a dozen sturdy followers are required.

Nákhodá Muda as well his deceased master, Ishmaila, did the King good service in a war with his brother in which he proved successful. For this reason Muda is allowed to trade exempt from all duties. Mr King pays the Rájá about 4,000 dollars annually and possesses several duties and monopolies. In Singapore the Nákhodá, like other considerable Bugís traders, is always attended by a large train of Bugís followers who shew him the same respect that a Malay chief receives from his retainers.

I was unable to arrive at any certain conclusions respecting the amount and distribution of the population, the quantity of exports, military strength &c., Nákhodá Muda promised to do his best to procure for me copies of the Agámá and Digámá and other books.

Such was the amount of our meagre information respecting Lombok before the late Dutch expedition to Báli. With respect to the latter island Mr. Freiderich's work may be expected soon to dispel the obscurity that still envelopes it. In anticipation of the early completion of this work we do not publish the translations which we have made of the notices in the Tijdschrift referred to by Dr. Hoëvell in his address, but if it should be postponed we shall insert them. In the meantime we shall give some extracts from Mr. Zollinger's recent interesting papers on Báli and Lombok (or Sassak). This naturalist, who is a member of the scientific commission of Netherlands India, has not only distinguished himself by his botanical discoveries, but by an ardent and enlightened pursuit of almost every kind of knowledge that can be acquired while engaged in prosecuting his researches. He is now investigating Sumbawa, and the other islands of the chain that stretches east from Java. The fullness with which he has treated of Báli and Lombok precludes us from giving his papers entire in one number. We begin with his notices of the religion of Lombok as it is likely to prove interesting to our readers from the singular modification which the Hindu practise of Suttee has there undergone.

OF THE RELIGION OF SASSAK.

By M. Zollinger.

We should perhaps say the "religions" of the inhabitants of Lombok, seeing that the rulers are Hindus and their subjects Mahomedans.

The Sassaks are not very zealous Mahomedans, and at all events are much less fanatical than their neighbours on the island of Sumbawa. This arises perhaps from Mahomedanism not having struck its root deeply, from the small number of priests particularly hadji who are found on the island, and lastly from the Balinese being very tolerant, and never obstructing their subjects in their religion.

A Sassak who becomes a Hindu enjoys the same priviliges as the Bálínese. His possessions are free from taxation. Again all Sassak girls who have been seized and purchased by Bálínese become Balinese, as do their children also. Hence it often happens that the whole family embraces the Bálínese religion, and so it is constantly gaining some believers. Mr. K. says that the contrary never occurs, that is he does not know an instance of a Bálínese having become a Mahomedan.

The Sassaks no longer know when and in what manner their forefathers became Mahomedans. It appears to me probable that the first Mahomedans came from Sumbawa and gradually converted the inhabitants of Lombok, or that this was effected by Bugís who resorted directly from Celebes as apostles of trade. In any event the conversion appears to have taken place in a peaceable manner, and not through the sword.

The religion of the Bálínese on Lombok is entirely the same as that of the inhabitants of Bálí. The worship, the temples, the calendar, the year, the months and their names, are all the same as on Bálí. I have thus little to tell that has not already been said by Crawfurd, or in my article on Bálí in the T. voor N. I., or in that of Melvill in the Moniteur des Indes. And since Mr. Freiderich has been for some time on Bálí with the special object of studying the political and religious institutions of that islsnd, we may expect much more careful and complete elucidations than all that I could here

set down. I shall therefore only speak of some matters which relate in a peculiar manner to the institutions of the Bálínese on Lombok.

Four castes are known on Lombok, Brahmans, Shatrias, Wasiyas and Sudras. The first are divided into *Idas* or priests, who perform the public services, and *Dewas* or descendants of priests, who do not perform any service. The first idá on Lombok is called *Pedanda*. The *gustis* are of the Shatria caste. To the third caste, that of the Wasiyas, belong the traders, the makers of weapons, and the goldsmiths (or *tukáng pándi.*) These two castes (shatrias and wasiyas) begin to mingle so much on Lombok that scarcely any distinction is now made between them. This perhaps arises in part from the Rájá's being, like those of Karang Assem and Baleling (in Bálí), of the race of the Wasiya caste. The cultivators, slaves &c., form the caste of Sudras. This caste is less numerous on Lombok than elsewhere, a circumstance which the history of the government of Lombok readily explains.

The castes may not intermix, with the above mentioned exception. The young Rájá of Mataram, for example, would marry a daughter of the first dewa, Dewa Anum. To enable this marriage to be effected it was necessary for the Dewa Anum to renounce his daughter, and drive her from his house, proclaiming that she was a wicked daughter. Not till then could the Rájá unite himself to her. She now acquired all the honours due to the wife of a king, but she had lost all the rights and honours of a daughter of a dewa.

The Bálínese of Lombok burn their dead. This is accompanied by very many ceremonies, which cost incredible sums of money. The poor, for this reason, often bury their dead, but always so that they can recover the bones should it ever happen that they can gather together enough of money to meet the expences of a cremation. The rich after death are embalmed, because months and even years often elapse before they are burned.

On Lombok wives may suffer themselves to be burned after the death of their husbands. They are not compelled to it. Such an event very seldom occurs, and during my stay there was only a sin-

gle widow who allowed herself to be krised. They have the choice of allowing themselves to be burned, or krised. The first is the most rare. The wives of the Rájás however must suffer themselves to be burned. When a Rájá dies some women are alwaye burned, even should they be but slaves. The wives of the priests never kill themselves. Having been present at one of these horrible spectacles I relate how it was conducted.

The gusti, who died at Ampanan, left three wives. One of them would let herself be krised for his honor, and that against the will of all on both sides of her family. The woman was still young and beautiful; she had no children. They said to me that a woman who, under such circumstances, suffered herself to be killed had indeed loved her husband. She intended to accompany him on his long journey to the gods, and she hoped to be his favorite in the other world.

The day after the death of the gusti his wife took many baths; she was clothed in the richest manner; she passed the day with her relatives and friends, in eating, drinking, chewing of sirih and praying. About the middle of the space before the house they had erected two scaffoldings or platforms of bambu of the length of a man, and three feet above the ground. Under these they had dug a small pit to receive the water and the blood that should flow. In a small house at one side and opposite these frame works were two others entirely similar. This house was immediately behind the *bali bali*.

At four o'clock in the afternoon men brought out the body of the gusti wrapped in fine linen, and placed it on the left of the two central platforms. A priest of Mataram removed the cloth from the body while young persons hastened to cover the private parts of the dead with their hands. They threw much water over the corpse, washed it, combed the hair, and covered the whole body with chámpáká and kánángá flowers. They then brought a white net. The priest took a silver cup filled with holy water (called *chor*) on which he strewed flowers. He first sprinkled the deceased with this water, and then poured it through the net on his body which he blessed, praying, singing, and making various mystical and symbolical motions.

He afterwards powdered it with flour of coloured rice and chopped flowers, and placed it on dry mats.

Women brought out the wife of the gusti with her arms crossed. She was clothed with a piece of white linen only. Her hair was crowned with flowers of the Chrysanthenium Indicum. She was quiet, and betrayed neither fear nor regret. She placed herself standing before the body of her husband, raised her arms on high, and made a prayer in silence. Women approached her and presented to her small bouquets of kembang spatu, and other flowers. She took them one by one and placed them between the fingers of her hands raised above her head. On this the women took them away and dried them. On receiving and giving back each bouquet the wife of the gusti turned a little to the right, so that when she had received the whole she had turned quite round. She prayed anew in silence, went to the corpse of her husband, kissed it on the head, the breast, below the navel, the knees, the feet, and returned to her place. They took off her rings. She crossed her arms on her breast. Two women took her by the arms. Her brother (this time a brother by adoption) placed himself before her, and asked her with a soft voice if she was determined to die, and when she gave a sign of assent with her head, he asked her forgiveness for being obliged to kill her. At once he seized his kris and stabbed her on the left side of the breast, but not deeply, so that she remained standing. He then threw his kris down and ran off. A man of consideration approached her, and buried his kris to the hilt in the breast of the unfortunate woman, who sunk down at once without emitting a cry. The women placed her on a mat, and sought, by rolling and pressure, to cause the blood to flow as quickly as possible. The victim being not yet dead, she was stabbed again with a kris between the shoulders. They then laid her on the second platform near her husband. The same ceremonies that had taken place for him now began for the wife. When all was ended, both bodies were covered with resin and cosmetic stuffs, enveloped in white linen, and placed in the small side house on the platforms. There they remain until the time is come when they are burned together.

It is always a near relation who gives the first wound with the kris, but never father or son. Sometimes dreadful spectacles occur; such was one at which Mr. K. was present. The woman had received eight kris stabs, and was yet quite sensible. At last she screamed out, driven by the dreadful pain, " cruel wretches, are you not able to give me a stab that will kill me!" A gusti, who stood behind her, on this pierced her through and through with his kris.

The native spectators, whom I had around me, saw in this slaughter which took place before our eyes, nothing shocking. They laughed and talked as if it was nothing. The man who had given the three last stabs wiped his kris, and restored it to its place, in as cold blooded a manner as a butcher would have done after slaughtering an animal.

Only the wives of the more considerable personages of the land allow themselves to be burned, because this is attended with much more expence than krising. They then make a very high platform of bambu. The woman ascends after many ceremonies, and when the fire is at its greatest heat. She then springs from above into the middle of the flames. Mr K. thinks that they do not suffer much because during the springing they are stifled; and at all events the fire, strengthened by fragrant resins, is so fierce that death must speedily follow.

I have already said that the Bálinese are very tolerant. They hinder neither Mahomedans, nor Chinese nor Europeans in the cultivation of their respective religions. The Rájá of Mataram only has sent away the English Missionaries, who wished to establish themselves on the island. This he has probably done at the instigation of Christians themselves as I have been told.

While I was on Lombok they were making every preparation for a great feast. This feast called " Karia Dewa Yagna" is given in honour of all the gods at very irregular intervals,—for example, once in 20, or 50, or 80 years. The Idas determine the period of the feast. The preparations were indeed uncommon for such a small country as Lombok. The feast must last 49 days, of which the last 15 are the great feast-days. Unfortunately I was not able to remain, but was

obliged to depart two days before the festival properly so called. They built an entirely new city where the great ceremonies were to be performed. The Rájás, gustis, idas &c., had each their house there. They made images of all kinds and sizes, in pasteboard and wood. On the last day of the feast they bring them in grand procession to the sea shore, and cast them into the sea under a salute of cannons and muskets and the noise of a hellish music. Every one receives and bestows presents, and above all the priests. They do nothing but dance, eat, drink and look at the *wayangs*. The Rájás had forbidden any cattle, poultry or other animals to be sold to the shipping from the fear that during the feast want might be felt. Mr. K. told me that the feast would cost the Rájás more than 150,000 florins, and that they would consume more than 30 piculs of gunpowder for the salutes during the processions. The number of animals that would require to be slaughtered to serve as offerings, and afterwards as food for the priests and the assistants, is almost incredible. The first offering of all is the rhinoceros which the Rájá had received from the Government. This animal was killed the day after its arrival. They may not at these celebrations make any use of offerings of the flesh of an animal that has died a natural death. And because the first rhinoceros which was sent died soon after his arrival, the second one was killed immediately, lest the same event should recur. When the feast is ended they burn the town, which is only built for it.

NOTES ON MALACCA.

By J. B. Westerhout, Esq.,

Assistant Resident at Malacca.

The Malayan Peninsula may generally be described as a region mountainous and hilly, with very extensive plains or valleys; the aspect altogether is very picturesque. The greater part of the interior is covered with extensive forests, containing fruit trees and in which savage animals roam; but they are peopled and cultivated here and there; the largest mountain is Gunong Ledang or mount Ophir which is about 5,600 feet above the level of the sea.* There are also two large rivers the Muár and the Lingey, the latter is about 480 yards broad and navigable for vessels of about 200 tons.

GOLD.

The mineral productions of Malacca are principally gold and tin. The Gold mines of Ophir were worked till the year 1817 by the Malays. About that time from 20 to 30 Chinese also commenced working, and have increased from time to time, so that the average number at present employed there is about 250 men. Eight Klings from the Coast of Coromandel have gone up this year; the gold is of 9 touch; the mines are at the foot of the mountain, and their general depth is from 70 to 200 feet. The Malay process of gathering the gold dust is very simple. They dig till they come to the rock, then break and pound it, carry it to a stream and wash off the gold dust. The miners have to pay a duty to Inchi Ahat the uncle of the present Tamungong of Muár, Toonku Sahid. The gold gathered is 24 catties annually; which is all brought to Malacca. The gold mines at Gámunchí were accidently discovered about 80 years ago by Panghulu Topay, who picked up a stone that was lying on the ground, and breaking it, found that it contained gold. The Malays then commenced working and found a small quantity After which the Panghulu died and his son Lasai succeeded. During his time he got people to go up from Malacca,

* According to Mr. Thomson the height is only about 4,320 feet. *Ante* p. 137.—Ed.

among whom was a man named Háji Amát who went up with 200 Malays about the year 1807, and worked the mines till the year 1824, when he left it, and Sengkong went up in his stead. He left off working on account of the Naning War, after which it was worked again from 1833 to 1840 by Amát bin Ludane. After his death they were often attacked by the Malay Rájás, on which they deserted the place, but since the year 1844 the Panghulu of Johore, having promised to protect them, encouraged their commencing again ; still there are very few at present. There are seven hills where gold is found, Gámunchí, Chindras, Tabong, Ládáng, Ayer Kuning, and two others. In Háji Amat's time they brought from 40 to 50 catties to Malacca annually. The distance from town is about 40 miles, and there is a good buggy road as far as the 19th. mile. The present population under Panghulu Mah Japar, consists of about 200 men.

TIN.

The working of the mines at first was trifling, principally from the want of capital, but lately they have been very successful; the first tin mine that was worked was at Titian Akar about 11 miles from town by a Chinaman, in the year 1793; and in 1807 Dool Syed opened one at Lendeck in Naning. In 1833 I opened several tin mines at Pandoy, Tungnay Bulu, and Lendeck in Naning, till 1835 when I left off working. In 1840 I assisted a Chinaman who opened one at Durian Tungal. He made a great profit, and was followed by many other of his countrymen. The principal mine here, I mean in the Company's territory, is at Cassang, at present worked by about 2,200 Chinese which was lately discovered. The quantity of tin brought to town from this mine is from 300 to 350 piculs monthly, which is readily sold at the rate of $ 16 per picul. More mines have been discovered towards Naning, Gapum, Duyong, during this month, where they have commenced working, and I think there is no doubt they will become equally rich and valuable when largely worked. There are about 1,200 men working in the other mines, at Durian Tungal, Naning and Ayer Pánás. These mines are all divided into Kongsees or companies, each under its respective Towkay. They have each a share in the produce. The quan-

tity of tin exported from Malacca yearly is 16,277 piculs, of which 4,277 piculs is from the Company's territory, 7,000 from Sungei Ujong, and 5,000 from Lukut. There are about 4,600 miners at Lukut, and Sungei Ujong, and 3,400 in the Company's territory. The mines are generally excavated in the swampy flats at the base of hills, from six to twenty feet deep, following the streams of ore, which will run to the distance of two or three miles. These excavations are called by the natives Limbongan. The excavations made by the Malays are inferior to those dug by the Chinese as they are too lazy to work the layers which lie deep.

POPULATION OF MALACCA TAKEN IN THE MONTH OF APRIL 1847.

	1846.	1847.
Christians, ...	2,700	2,784.
Malays, ...	33,161	33,473.
Chinese, ...	9,414	10,589.
Arabs, ...	177	195.
Battas, ...	329	387.
Hindus, ...	1,082	1,023.
Chulias, ...	5,048	5,454.
Siamese, ...	31	35.
Bengalese, ...	179	199.
Javanese, ...	173	313.
Bugese, ...	178	248.
Balese, ...	11	46.
Caffres, ...	45	50.
Convicts, ...	185	199.
Total, ..	52,713	54,995.

Malacca, August, 1847.

OFFERINGS ON THE ISLAND SEMAU.*

It has been somewhere related that the Rájá of Kupang, on the island of Timor, formerly sacrificed a young virgin of royal descent to the Alligator, by throwing her into the sea in order to be swallowed by that monster.

This however is a fable, but it is a fact that such an offering was made on the south east point of the island Semau where the coast forms a small bight. After the harvest of the cultivated plants the whole population were bidden to assemble, and all kinds of sugar cane, rice, fowls, eggs, pigs, dogs and a little child were placed on the ground at the sea shore and offered to the evil spirits. After the invocation was ended the whole, except the child, were consumed by the assembled people. These offerings still take place, with the exception of the child which is no longer offered in shew.

The writer of this notice has been at the place itself where the offerings are brought, and was accompanied by the Rájá himself, who explained the ceremony in all its incidents, but a virgin has never been used for the occasion.

CANNIBALS ON THE ISLAND FLORIS.*

On the island Floris there lives a race called on the south coast Rakka, who not only devour their enemies, but with whom custom requires that the son shall cut the body of his deceased father in pieces, and sell the flesh to the inhabitants at the high price of its weight in gold. This flesh is greedily eaten by the people as a great delicacy. If the father was heavy and of great size the son considers himself particularly fortunate. The population of *Endore* on the same island is also very greedy of human flesh. But these cannibals confine themselves to the heart which, with an incredible dexterity, they extract from the body by giving one blow under the left shoulder blade. It is then cut into very small pieces and eaten completely raw by the bystanders who belong to the same race.†

Translated from the Dutch (*Tijds. v. Neerl. Ind. 9 Jaarg. 10th Afl.*)

† It were desirable that the Editor of the Tijdschrift gave the authority on which such statements rest. We confess that to us the communication wears an apocryphal or at least exaggerated air.—ED. J. IND. ARCH.

A WHITE DEER.*

I have often in hunting talk heard different and sometimes very strange accounts of the existence of white deer.

I have always doubted this, because no proof of the fact has ever been afforded me. Thus amongst others I recollect in 1840 many stories about the existence of a large pure white deer with red eyes in the neighbourhood of Batavia, near the shore at Antjol, and which had escaped the lead of many experienced shots by its invulnerability. Of this supernatural invulnerability the inhabitants above, all the natives, were convinced, while many Chinese partook in the belief, and even some Europeans remained in doubt until a well directed shot gave the animal in question into the hands of the fortunate hunter, when it appeared that the deer was not of a white but a grey colour, occasioned by its age being unusually great, so much so that its flesh was found scarcely eatable. The eyes too were not red, but like those of all other deer. On my arrival in Macassar in 1845 I again heard stories of white deer, which, it was said, were chiefly to be found in the territory of the principality of Goa. Each of my informants had this from hearsay, but nobody had seen such an animal with his own eyes. Consequently I still remained in doubt on this point. Not long ago however the elevé of the territorial revenues J. A. J. Voll, surprised me by the present of a young living deer which had been caught in the woods of Pancajene, and which is quite white in its colour. This animal, whose eyes and other attributes agree in all points with those of other deer, is now in my possession, and excites the astonishment of every visitor, European as well as most of the natives of these countries.

For this reason I have considered that I should be rendering an agreeable service by mentioning this fact, and I request the favor of the Editor T. N. I. giving a corner to these lines in his Journal.

Maros
1 October 1846

D. F. Schaap,
Assistant Resident.

* Translated from the Dutch *(Tijd. v. N. I.)*

AREA OF THE INDIAN ARCHIPELAGO AND OF THE ISLANDS CLAIMED BY THE NETHERLANDS.

The following Tables, shewing the entire area of the islands of the Indian Archipelago and that of the islands and parts of islands considered by the Dutch to belong to them, are taken from the "Moniteur des Indes-Orientales et Occidentales," a periodical published in Holland and ably edited by Baron Melvill van Carnbee, an officer in the Netherlands Indian service, who was engaged, during several years, in surveys in the Archipelago. It will be observed from Table II. that five-sixths of the whole Archipelago are regarded as Dutch possessions, and that amongst them are included all Sumatra, with the exception of Acheen and Siak, three-fourths of Borneo, that is the whole island with the exception of the N. E. Peninsula and a narrow band along the N. W. coast terminating at T. Datu, the whole of Celebes, Bali, Lombok, &c. As this is the first distinct statement which we have seen of the territories at present claimed by Holland, and as it amounts to an assertion of the dominion of the whole Archipelago with the exception of one-sixth part, we consider these Tables of great importance. It would be interesting to know whether the British Government is in possession of copies of all the treaties and acts of cession on which the right to all the parts of this magnificent colonial empire that have been acquired since 1824 is based.

TABLE I.

Superficies of the Indian Archipelago.

Names.		Square geograph. leagues.	Square Myriametres.	Square Geograph. leagues.	Square Myriametres.
SUMATRA, ...				8035, 0	4403, 3
Islands along the east coast of Sumatra.	Pulo Babi, ...	30, 0	16, 5		
	Pulo Nias, ...	75, 0	41, 1		
	Pulo Mintao or Siberu,	30, 0	16, 5		
	Pora islands.	75, 0	41, 1		
	Poggi „	35, 0	19, 2		
	The Enganos and other small islands, ...	25, 0	13, 7	270, 0	148, 1
JAVA, ...				2313, 0	1269, 1
MADURA, ...				97, 3	53, 4

Names.		Square Geograp leagues.	Square Myria-metres.	Square Geograp. leagues.	Square Myria-metres.
Islands near the coast of Java.	Pulo Bawean and the Kangeang isles, ..	21, 9	12, 0		
	Islands in the straits of Sunda, the Krimon-Java islands, &c. ..	12, 4	6, 8	34, 3	18, 8
BANKA, ...				223, 0	112, 4
BILLITON, ...				119, 0	65, 3
	Islands near Billiton in the Straits of Gaspar and of Banka,..			7, 0	3, 8
Archipelago of Rhio & Linga (Johore Archipelago.	Bintang, ...	21, 0	11, 5		
	Linga,..	17, 9	9, 8		
	Battam, ...	8, 0	4, 4		
	Sinkep, ...	9, 5	5, 2		
		36, 0	19, 8		
				92, 4	50, 7
BORNEO,..				12743, 1	6992, 1
Islands along the west coast of Borneo.	Pulo Buang Orang or Great Natuna.	29, 0	15, 9		
	Islands near Gt. Natuna	1, 0	1, 6		
	South Natuna islands, .	4, 0	2, 2		
	Pulo Jimaja, ...	3, 5	1, 9		
	Pulo Mata, ...	2, 0	1, 1		
	Other islands Anambas	4, 7	2, 5		
	Tambelan islands &c.,	7, 0	3, 8		
	Carimata &c., ...	8, 0	4, 4		
	other small islands near the west coast of Borneo.	6, 0	3, 3	65, 2	35, 2
Pulo Laut, ...				45, 0	24, 7
Islands along the east coast of Borneo.	Pamaruang, ...	30, 0	16, 5		
	Balabalagá, ...	6, 0	3, 3		
	Maratua, ...	21, 0	11, 5		
	Tarakkan Ligetan, &c.	16, 0	8, 8	73, 0	40, 1
The Sulu and Basilan islands.	Sulu, ...	18, 0	9, 9		
	Other Sulu islands, ..	3, 3	1, 8		
	Tapul islands, ...	5, 2	2, 9		
	Pugutaran islands. ..	5, 0	2, 7		
	Samar Laut islands, ..	2, 5	1, 4		
	Basilan, ...	22, 2	12, 2		
	Islands near Basilan,..	1, 5	0, 8		
	Tawi Tawi Islands, ..	26, 0	14, 3	83, 7	50, 0
Islands near the N. point of Borneo,	Cagayne, Caluja, Cavilli, St. Michel and Cajagan-Sulu,.. ..	2, 4	1, 3		
	Balabak, Baguey, &c.,	26, 3	14, 4	28, 7	15, 8
CELEBES,..				3578, 0	1963, 3
Buton, ...				86, 2	47, 3
Pengasan, ...				46, 5	25, 5
Other islands to the S. and W. of Celebes.	Tukan-besi, Kambyna, Saleyer. and islands to the S. of Saleyer,.. ..	45, 0	24, 7		
	Is. to the W. of Celebes,	9, 0	4, 9	54, 0	29, 6

Names.		Square Geograp. leagues.	Square Myria-metres.	Square Geograp. leagues.	Square Myria-metres.
Islands along the E. coast of Celebes.	Xulla and Bangaai, ..	113, 0	62, 0		
	Islands of the Bay of Gorontala, ...	10, 0	5, 5	123, 0	67, 5
Islands to the N. of Celebes	Sangir, ...	13, 0	7, 1		
	Siauw, Tagolanda, Bejaren &c., ...	7, 0	3, 8		
	Talaut, Meaugis, ..	18, 0	9, 9	38, 0	20, 9
BALI, ...				105, 3	57, 8
LOMBOK, ...				103, 5	56, 8
SAMBAWA, ...				278, 0	152, 5
FLORIS or ENDE, ...				252, 0	138, 3
Islands to the E. of Floris.	Comado and other islands in the Straits of Sapi, ...	16, 0	8, 8		
	Adenara, ...	8, 0	4, 9		
	Solor, ...	5, 0	3, 1		
	Lombatta, ...	24, 8	13, 6		
	Putare, ...	13, 1	7, 2		
	Ombaai, ...	45, 8	25, 1		
	Other islands, ...	1, 5	0, 8	115, 8	63, 5
TIMOR, ...				613, 0	336, 4
Islands to the W. of Timor.	Samao, ...	8, 4	4, 6		
	Rotti, ...	30, 8	16, 9		
	Savu, ...	11, 3	6, 2		
	Other islets, ...	5, 5	3, 0	56, 0	30, 7
SUMBA or SANDALWOOD, ...				236, 5	129, 8
Islands of the S. W. (Wetter &c.) ..				110, 0	60, 3
Tenimber Islands, ...				150, 0	82, 3
Aru Ids., ...				65, 0	35, 6
Kei Ids., ...				60, 0	32, 9
Ids. of the S. E.				14, 0	7, 7
Islands of Banda, ...				1, 1	0, 6
CERAM, ...				309, 0	169, 5
BURU, ...				161, 0	90, 0
Island S. & W. of Buru.	Amboyna, ...	13, 3	7, 3		
	Other islands, ...	5, 0	2, 7	18, 3	10, 1
Obie Besar, ...				39, 0	21, 4
Islands near Obie Besar, ...				7, 0	3, 8
HALMAHERA or GILOLO, ...				313, 5	172, 0
Islands near Gilolo,	Batchian, ...	50, 0	27, 4		
	Ternate, ...	0, 7	0, 4		
	Tamally, Mandoli, Latta, Tidore and other islands, ...	48, 8	26, 3	98, 7	54, 2
Waigin, ...				60, 0	32, 9
Battanta, ...				13, 0	5, 7
Salawattie, ...				33, 0	18, 1
Misole, ...				37, 0	20, 3
Is. near Waigin, Salawattie, Misole &c.,				30, 0	16, 5
Total area of the Indian Archipelago.*				3112·8	1724·4

* It will be remarked that the Malay Peninsula on the one side and New Guinea on the other are not included in this Table.

Table II.

Superficies of the Netherlands Possessions in the Indian Archipelago.

Names.		Square Geograp. leagues.	Square Myria-metres.	Square Geograp. leagues.	Square Myria-metres.
Island of Java and the surrounding Islands.					
Java, ...		2313, 0	1269, 1		
Madura, ...		97, 3	53, 4		
Other islands near Java, ...		34, 3	18, 8	2444, 6	4341, 3
Island of Sumatra and the surrounding Islands.					
Government of the West Coast.	The Residency of Padang and the interior, ...	250, 0	137, 2		
	The Residency of Ayer Bangies and Tappanulie, ...	525, 0	288, 1		
	The Residency of Benkulen,..	740, 0	406, 0		
	The kingdoms and states of the interior of the island and along the East coast under dependency of Government (The country of the Battacs, the kingdoms of Kamper, Jambi, Indragiri, the district of Korinchi &c.*)	2979, 0	1635, 6		
	The islands along the West Coast, ...	270, 0	148, 1	4764, 0	2614, 0
The Districts of Lampong,..				535, 0	293, 5
The Residency of Palembang, ...				1340, 0	735, 3
Islands of Banka.					
The Residency of Banka.	Banka, ...	223, 0	122, 4		
	Billiton, ...	119, 0	65, 3		
	Other islands, ..	7, 0	3, 8	349, 0	191, 5
Archipelago of Riu (Rhio.)					
The Residency of Rhio.	Bintang, ...	21, 0	11, 5		
	Linga, ...	17, 9	9, 8		
	Other islands near Bintang and Linga.	53, 5	29, 4		
	The Natuna, Anambas and Tambilan islands,..	47, 1	25, 8	139, 5	76, 5
Island of Borneo and the surrounding Islands.					
The Residency of Sambas.	Kingdom of Sambas,	218, 1	126, 1		
	Small islands, ...	0, 6	0, 3		

* In this number are comprised all the small states of Sumatra, except those which compose the kingdoms of Achin and Siak of which the superficies is estimated at 924 and 732 square geographical leagues.

	Names.	Square Geograp. leagues.	Square Myria-metres.	Square Geograp. leagues.	Square Myria-metres.
The Residency of Pontianak.	The kingdoms and provinces of Pontianak, Mampawa, Landakh, Kubu, Simpang, Sakadana, Matam, Tayan, Meliouw, Sangouw, Sekadon, Sintang, Melawi, Sepapu, Blitang, Silat, Sambas, Piassa, Jongkong, Bunat, Malor, Taman, Ketan, Punan &c....	2459, 1	1349, 3		
	The islands Penembungon, Karimata &c., ...	11, 5	6, 3		
The Residency of Banjermassing.	The kingdoms and Provinces of Bulongan, Gunong Tebur, Tanjong, Kutei, Passir, Tanah bumbu, Tanah Laut, Duson, Bekompei, Banjermassing, Pulo Petak, Kabajang, Kupuas, Mendawi, Sampit, Pembuang, Kottawaringen, &c., ...	6515, 9	3575, 3		
	The islands Laut, Nanka, Maratua &c., ...	108, 0	59, 3	9343, 2	5126, 6
ISLAND OF CELEBES & THE MOLUCCAS.					
The Government of Makasser.	Part of the island of Celebes, ...	1674, 0	918, 5		
	Island of Sumbawa,	278, 0	152, 5		
	Islands of Buton, Salayer &c , ...	186, 7	102, 4	2138, 7	1173, 5
The Government of the Moluccas. — Residency of Amboina.	Island Amboina,..	13, 3	7, 3		
	Part of Ceram, ..	254, 0	139, 4		
	Island Buru, ..	164, 0	90, 0		
	Other islands, ..	5, 0	2, 7	436, 3	239, 4
Residency of Thenadi.	North part of Celebes, ...	1433, 0	786, 3		
	Islands Sian, Sangir and Talaut, ..	38, 0	20, 9		
	Islands of the Bay of Gorontalo, ..	10, 0	5, 5	1481, 0	812, 7
Residency of Ternate.	Part of Celebes, ..	471, 0	258, 4		
	Islands Xulla and Bangaai, ...	113, 0	62, 0		
	Halmahera, .. .	313, 5	172, 0		
	Islands Obie, Batsian, Ternate, Tidore, &c., . ..	144, 7	79, 4		
	Is. Waigiu, Battanta, Salawatti, Misole, &c..	173, 0	94, 9	1215, 2	666, 8
Residency of Banda.	Islands of Banda...	1, 1	0, 6		
	S. E. part of Ceram	55, 0	30, 2		
	S. E. islands, Key, Aru, Tenimber & South West, ..	399, 0	218, 9	455, 1	249, 7

Names.	Square geograph. leagues.	Square Myriametres.	Square Geograph. leagues.	Square Myriametres.
ISLAND OF TIMOR, &c.				
Part of Timor, ...	361, 0	198, 2		
Islands Rotti, Savu, Sumbah Ende, Adenara, Solor, Lombatte, Putare, Ombai, &c.	660, 3	362, 3	1021, 3	560, 5
Islands. of Bali and Lombock, ...			208, 8	114, 6
Total of the Netherlands Posssesions in the Indian Archipelago.* ..			25872	14196

* In this total is not comprised the western part of New Guinea, recognized as Dutch.

MALAY PANTUNS.

تالي بايد دداون فيسغ
كاين باسه كريغ دغڠغ

باتغ سنا دبوغا راي
كارن تيدق داي اوفاي

باتغ سنا دبوغا راي
كارن تيدق داي اوفاي

فاته سلاسيه ددالم فوان
منتأله كاسيه فدامو توان

فاته سلاسيه ددالم فوان
منتاله كاسيه فدامو توان

سايغ فيدادا بوه فيدادا
كالوكن ادا كتاكن اد

سايغ فيدادا بوه فيدادا
كالوكن اد كتاكن اد

برمبغ جاته كفاي
جاڠنله بمبغ هاتين سهيا

برمبغ جاته كفاي
جاڠنله بمبغ دهاتي سهيا

جاته كتامن بفجارن ساري
دودق برچنتا سهاري٢

جاته كتامن بفجارن ساري
دودق برچنتا سهاري٢

ربب سراهي ددالم فوان
سبب براهي فدامو توان

ربب سراهي ددالم فوان
سبب براهي فدامو توان

فندان فودق تمبه دڠغسا
بدان منڠوغ تيدق كواس

فندان فودق تمبه دڠغسا
بدان منڠوغ تيدق كواس

ايكن دسمبر سيبورغ باڠو
دمان دودق دسان ترماڠو

ايكن دسمبر سيبورغ باڠو
دمان دودق دسان ترماڠو

جاته كفوهن ناڠ ساري
گيلا دان مابق سهاري٢

جاته كفوهن ناڠ ساري
گيلا دان مابق سهاري٢

بله بمبن دفادغ تمو
سبب دندام تيدق برتمو

بله بمبن دفادغ تمو
سبب دندم تدق برتمو

لقسمان برلادغ لادا
بڭيكن بله راسان دادا

MISCELLANEOUS NOTICES, CONTRIBUTIONS AND CORRESPONDENCE.

LETTERS FROM THE INTERIOR OF BORNEO (WEST COAST.)

NO. I.

Karangan, 11th Dec. 1847.*

I have to thank you, and I do it heartily, for the Nos. of your desirable periodical for July and August; if the same polite attention has intended any subsequent No. for my possession, I am, to this date, a loser. As various causes have conspired to deprive me for the last 8 days almost wholly of rest, and as I know not at what moment I may be called to make up my parcel for the coast, I cannot confidently promise myself the pleasure of discharging, in any degree as I could wish, the obligation you have undesignedly imposed. The "Spirit of thanks", however, *never repudiates*, and, though extreme weariness be upon me, I send you a few notices of the site of our Mission, fondly designated "FOREST HOME". Three years since, a very interesting sketch of our premises was made by the late Mrs. Thomson, within four weeks of her decease, and I regret that I have no copy and cannot supply its place. The spot from which I write is called by the Dyaks "Oto", and the fruit-trees of our gardens will, in years to come, wave their tops in rivalry and almost direct contact with the magnificent old monarchs of the natives' Timawak† or Timbawang of that name. The village-house of the Dyaks has once been within a few rods, but they often change their place of residence (there have been two changes within 4 years, in the case of our next neighbours), and the names of villages, i. e. of different camping-spots for the same sets of families, are constantly going out of use, as new spots are built upon and named; probably, however, in many cases, it is but a re-occupancy, by the sons, of what the fathers had once similarly used and left.

* We received this letter on the 25th. of February. A subsequent one from the same correspondent reached us much sooner. We did not notice it in our last number as we were not then in possession of the writer's name. We shall have much pleasure in presenting a copy of the Journal to the gentleman mentioned by our correspondent.—ED.

† Orchard or fruit garden.

Karangan may be styled our township, Landak our shire or country,—Pontianak Residency being our province or state. I am not aware that our latitude and longitude are known, but it is very possible that Dutch gentlemen may have made observations for the purpose of fixing the position of Landak, and the village of that name is, in a direct line, but a few miles distant hence, though a day's boating is necessary to reach it, by water. Following the course of the winding river Landak and the 7 or 8 miles that lie between Oto and the junction of our stream with the larger river, we may be at 140 miles distance from Pontianak and about 150 from the sea; the passage to the mouth of the Karangan I once made, by the severe efforts of three very superior oarsmen in 90 hours, during more than 75 hours of which they used their utmost exertions. Parts of the route were certainly passed over at the rate of 4 miles an hour, and in few reaches of the river did we *seem* to achieve less than $1\frac{1}{2}$, but such was the current that it is impossible to judge; it may be added, however, that *six* oarsmen (taking, it is true, more rest) have repeatedly spent more time upon the same distance. In going down the river I have accomplished the first 60 miles, with the same boat (planking thick and heavy, to avoid destruction by abounding snags) and the same number of good cheery rowers, in *nine hours*, noon to 9 o'clock P. M.: it is very hazardous to go rapidly by night, and even the floating boat requires a constant look-out ahead, but that was a special trip, the whole distance having been traversed in 27 hours. A more common time spent by passengers is from 48 hours upwards. Upon the whole, allowing, at a venture, for the excessive crookedness of the river, I would place Karangan a degree and a half east of Pontianak, while our latitude is nothing to speak of; the town of Pontianak lies upon the Line, and we are not many minutes north of it. The celebrated hill of superstition, TIONG KANDANG (2500 feet, perhaps, in height,) lies about 20 miles south of Oto, and a visit to it or to the villages a trifle beyond would give title to all the privileges of "crossing the line", if there be any for landsmen. The crystal Karangan, as it flows westward, on our front, is a narrow stream, varying in depth from difficult shallows to several feet of water

in the dry season, its banks rising from 5 to 10 feet above it: in the season of rains, it is often a rushing torrent that floods its level vicinity. On two beautiful knolls that swell gently up from the stream, and but few rods from it, is the site that nature has given for the bark-built dwellings of the white man, and the forest that originally covered the spot has retreated but a simple stone's throw on any side of us. Our three homes, which are sufficiently spacious, may have cost five hundred dollars, and price or rent for ground there is none.

The Government of Netherland India is, under God, our protection in this wild-woods seclusion, the rioting ground of indolence, famine and mendacity. As a rule, our neighbours, even in planting or preserving their grain from the beasts, *work when they must*, and a consequence has been, in 1847, that rice has been sold, dribblingly, at the rate of nearly five dollars per picul, which is a famine price in a region where, at the end of a good harvest, the same amount of money will buy 350 Landak gantangs of padi, or *from ten to eleven piculs* of clean, merchantable rice! Ordinarily, at the end of 8 months from the annual harvest, few of those nearest us have rice of their own, but buy, or become indebted for it, little by little, at the rate of $2 per picul. This year, it has been quite necessary for me to order rice from Pontianak, and the people have depended, chiefly, upon Sago from the ever productive forest, accompanying the consumption, however, with complainings loud and deep, as to its quality, when within earshot of Tuan. Should our Dyaks have a tolerable harvest in January and February now at hand, the threshing scene will be a joyous *ball*, in explanation of which term I should say that the operation is performed by the feet of men and women who form a line, and clasping, with both hands over their heads, a tensely-drawn rattan strung horizontally above them, execute a most vigorous, dancing wriggle. Knowing their style of dress (the men in a simple bark chawat for the loins, and their partners wearing a close-fitting apron of 15 to 18 inches) you will form a tolerable idea of the scene, but it must be witnessed if one would know the effect of the odd and ever varying "tableaux vivants." As you may suppose

their merriment is unbounded when lookers-on are present. At some future day, I hope an early one, it will afford me pleasure to introduce to you my Dyak neighbors, whom, with all their faults and vice, I love, and hope to see changed in spirit and estate. There are among them men of very apt discernment, who perceive the bearing of a remark with electric quickness, and, in all their aimless degradation, the embers of an indomitable pride still sleep, to be easily fanned to a glow by passing gusts. Nor has the rust of indolence utterly eaten out all energy, as a glance at the usual phases of "Sadang", i. e. kampong, life might lead one to suppose: and yet, in the preparation of rice-grounds, they are reckless beyond all shame, and there are those who, from year to year, plant perhaps seven gantangs of padi, and reap 150 to 200, worth at harvest prices *less than three dollars!* In a family of adults and children a supply of padi equal to "sa'ratus sa'orang" is reckoned abundant for support and hospitality. I will record, next time, some pleasing features of their life.

KALAMATAN.

AN EEL FASCINATED BY A SNAKE.

Genus, Coluber. Div: Xenopeltis, somewhat modified having its dorsal aspect black, and its ventral yellowish white. Subcaudal scales double but interrupted by single transverse ones. Length of body about 4 feet with a head not much larger than the body, with large irregular scales behind the eyes. Teeth fixed; neither maxillary fangs nor large upper maxillary teeth with apertures.

This snake, from these characters, cannot be said to belong to the venomous kinds, although the native who was with me when I secured it affirmed that it did; but it is very frequently the case that all serpents are considered by natives, and even by Europeans, as poisonous, more especially when of a black, or lurid colour. What attracted my attention was a property of fascination or charming, and that exerted on an animal so low in the scale of creation as an Eel. This property is seldom allowed to any snakes out of the class of Crotula or Rattlesnakes, but notwithstanding in this instance it was most distinct.

On approaching an almost dry drain, I saw this snake slowly extending its coils, raising his head, and steadfastly gazing on what I saw to be an eel of about a foot in length. The eel was directly opposed to the snake, and glance seemed to meet glance, when the snake, having gained the requisite proximity, darted on the eel and caught it about an inch behind the head, and carried it off, but the captor was soon himself the captive, for with a blow on his head I secured both.

POWER OF THE COBRA TO PROJECT ITS VENOM, AND INFLAMMATION OF THE MUCOUS MEMBRANE THEREBY EXCITED.

Coluber Naia. L., or Cobra di Capello, or hooded Cobra is easily distinguished by its power of raising and protruding its anterior ribs so as to give its neck a flattened, broad and somewhat fringed appearance. At present this snake is very commonly met with on the tops of hills in and near our Bungalows, on account of the continued wet weather, and is as well known as it is dreaded by the natives.

On examining its mouth, in the roof and in a recess of the mucous membrane will be found 2 fangs pointing backwards, and which in the unexcited state of the animal lie flat in the groove, but by a muscle attached to the upper part of each fang, they can be raised and fixed at an angle of 45 with the Palate. One reason of this pointing backwards of the fang is to prevent the regurgitation of the food, when the animal has a large object in its mouth partly swallowed; if the fangs assisted by the teeth did not so act like the catch on a wheel, the muscles of the throat would force back the object before it was sufficiently prepared to be swallowed. This arrange- so useful to the animal, is a great boon to mankind, for a snake of this description unless it can enclose a part of the body such as a toe, a finger or the tendon of the heel will not be apt to poison the individual, as the bite from the 2 rows of teeth has no dangerons results. From the groove in the fang a duct proceeds, to terminate in a gland which secretes the poison and is situated in the temporal region, below and behind the eye and at the junction of the jaws. This gland has a separate part of the temporal muscle dedicated to compress it by its contractions, and propell the poison from the gland along the duct into the fang. When the animal has

grasped an object by its jaws, and fixed its fangs in it, the same movement forces the poison with great force into the wound.

It is a general belief that unless a wound exists no injury will ensue from the poison of the snake, and in the course of some experiments lately made in Italy, this belief is strengthened, by the fact of a pupil of Professor Mangili's having swallowed at once the whole poison of four vipers, without suffering any inconvenience, and that of six vipers was given to a blackbird, that of ten to a pigeon, and that of sixteen to a raven with no other effect beyond slight and transient stupor. But the indulgence of this belief, that provided there is no abrasion or wound of the mucous membrane, the poison can be safely applied, may lead to dangerous consequences as is shown by the following facts.

1st. A Syce to Mr. L——— the other evening, while in the cook house, was attracted by a large dog who accompanied him making certain indications of pursuing something; he looked and saw it to be the black Cobra di Capello. The dog made a spring at it, the Cobra coiled itself erect, distended its neck, and without springing made a hissing puffing noise. The man called away the dog until he got a stick to kill it, but on his return to do so found it had disappeared. The next day the dog's eyes were dreadfully inflamed, and the conjunctiva covering the eye, as well as lining the eyelids, much swollen, but in 3 or 4 days all inflammation vanished and no traces of the effects of the poison were left.

2nd. A dog belonging to Mr. D——— not many days before was similarly treated by a like description of snake; and

3d. Almost at the same time a Butler of Mr. A——— on seeing a black Cobra attempted to take hold of it by the tail, when it turned round and puffed the poison in his eye, from the effects of which he suffered for some days, but differently from the dog, he having merely redness of the conjuctiva and pain to such an extent as to deprive him of sleep for 2 nights.

From these cases we see

1st. That the Cobra has the power of projecting his poison to some distance, in one of the cases the distance must have been 3 feet.

2d. This could not have been done by the same muscle which forced the poison from the gland to the fang, as from its direction being downwards and backwards the poison would have been forced to the lower and back part of the animal's mouth, but the poison having passed from the fang, must have been afterwards expelled during an act of expiration, assisted by what is rudimentary of the buccinator muscle so giving rise to the puffing noise.

3d. That it is not necessary that the poison should be applied to an abraded surface for it to act, but the mere application to the healthy mucous membrane is sufficient to excite severe irritation and imflammation, which is however very different from the narcotico acrid action of the poison as introduced by a wound. The curious will therefore mind their eye when they approximate their faces to a snake of the above species let it be tied ever so well.

EARTHQUAKES IN JAVA IN DECEMBER 1847 AND JANUARY 1848.*

A slight shock of earthquake was felt in the Residency of Tegal on the 27th. December about half past 10 o'clock A. M.—*Javasche Courant 12th January.*

In the night between the 6th and 7th January about 4 o'clock a very heavy earthquake was felt in the residency Kedirie, the division Patjitan, and the residencies Djokdjokarta, Kadoe and Baglen, which appears to have been violent and prolonged at the above named places The accounts received concerning it all agree that the shock was felt in a direction of north to south. It was heaviest in the division Patjitan, and the shaking of the ground there caused much lime to fall from the walls, without however doing further damage: on the morning of the 8th January a second shock was felt there which was not very heavy.

At Djokdjokarta some serious rents have taken place in the walls of the residency office, and some remarkable workings of the mountain Merapie took place before, during, and after the earthquake. 29 hours before the shock a deep subterranean noise was heard by some persons at the foot of the Merapie. *Ibid, 19th Jany.*

* From the Singapore Free Press of 10th. February.

In a letter received from China the writer regrets that his distance from our field of observation precludes him from being a correspondent of any value. We would refer him, and all other residents in China who are disposed to assist us, to the title of the Journal, and to our prospectus and desiderata. There are and have been too many intimate relations of various sorts between China and the Indo-Chinese and Archipelagic countries to admit of our confining our attention to the latter, even if our plan did not embrace the former, and we shall highly esteem any contributions or notes upon it.

A literary annual has been commenced at Batavia under the editorship of Dr. Munnich. It contains a very considerable variety of pieces in prose and verse, many of which possess much merit.

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*Maxima and Minima of atmospherical temperature at Singapore.**

January, 1848.

	Min.	Max.		Min.	Max.
1	72½	77	17	70½	85
2	73½	77	18	72½	87
3	71½	85	19	69½	88
4	70½	83	20	73½	84
5	72½	78½	21	70	85
6	71½	82	22	72½	86
7	no	obs.	23	74	84
8	71½	84½	24	72½	85
9	71		25	71	88
10	70½	86	26	72½	84
11	72½	84½	27	70½	82½
12	72	85½	28	71	86
13	69½	82	29	71½	88
14	71½	84½	30	71½	88½
15	72½	87	31	71½	86
16	71½				

Mean { Min. 71. 63⅓ / Max. 84. 41

J. R. L.

* By day and night self-registering horizontal thermometers (Troughten and Simms) placed in the shade in an open verandah at Rochor Cottage, facing the Race Course.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

ON THE MALAYAN AND POLYNESIAN LANGUAGES AND RACES.

By John Crawfurd, Esq., F.R.S.*

Distinct and unequivocal traces of a Malayan† language have been found from Madagascar to Easter island, and from Formosa to New Zealand, over 70 degrees of latitude, and 200 of longitude.

To account for this remarkable dissemination of a language, singular for its extent, among a people so rude, it has been imagined that all the tribes within the wide bounds referred to constitute, with the exception, however, of the Papuas or Negroes, one and the same race, and that the many tongues now known to be spoken by them, were, originally, one language, broken down, by time and dispersion, into many dialects. This is the theory adopted by Mr. Marsden, Sir Stamford Raffles, and the Baron William Humboldt, as well as by many French and German writers, but I believe it to be wholly destitute of foundation.

A sketch of the different groups of nations within the range I have alluded to, will shew, that whether their languages be of one stock or not, the men themselves belong physically to distinct races. They

* Read before the Ethnological Section of the British Association, June 1847.

† I use this word as a common term for all that belongs to the Archipelago.

may, I think, be divided into three groups—men of brown complexion, with lank hair; men of sooty complexion, with woolly hair; and men of brown complexion, with frizzled hair. Each of these, again, consists of several subdivisions.

Beginning with the first group, the most remarkable race in it is what may be called the Malay. The prevailing complexion is here, a light brown, with a yellow tinge; the hair is lank, long, coarse, abundant on the head, and defective on every other part of the body; the nose is short and small, but never flat; the mouth is large; the lips thin; the cheek-bones high. The person is squat, and the average stature does not exceed 5 feet 3 or 4 inches.

This is the only race, within the bounds described, that has exhibited a considerable intellectual development. It has, for ages, possessed the knowledge of letters, worked the useful metals, and domesticated useful animals. Judging by the evidence of language, these arts are of native growth, and not borrowed from strangers.

All the inhabitants of Java, Sumatra, Borneo, Celebes, Bali, Lombok, and Sumbawa, are of this race, as are most of those of the Malayan Peninsula, and of the Philippine Islands.

East of Celebes and Sumbawa, and lying between these and New Guinea, there is a second division of men of brown complexion and lank hair, constituting, probably, a distinct race. The stature is the same as in the last, but the complexion is darker, the features generally coarser, the lips thicker, and the hair often buckling or even frizzling, so as to give them an appearance of being an intermediate race between the lank and woolly haired families. The inhabitants of Flores, Gilolo, Timur, the Moluccas, and several smaller islands, would seem to belong to this race, who, although they have made considerable progress in the arts, have never invented the use of letters. The inhabitants of Gueby, an island lying between Gilolo and New Guinea, may be taken as a fair example. M. Freycinet describes them as being of a dark olive complexion, with flat noses, projecting lips, and a facial angle of seventy-seven degrees, which is from ten to twelve degrees higher than that of the oriental negro of the same neighbourhood.

The inhabitants of the Caroline, the Marianne or Ladrone, and Pelew Islands, probably constitute a third subdivision of the brown-complexioned and lank-haired people. The average height of five individuals, as taken by Freycinet* and his companions, was 5 feet 7 inches English. This would make them much taller than the Malay race, but probably the height is over-rated, from the average being taken from too small a number of individuals, and not including women.

Passing over countries inhabited by negro races, and entering the Pacific, we first encounter a race with brown complexion and lank hair in the group of the Feejee and Friendly Islands, in about 180° of east longitude. The same race constitutes the inhabitants of the Society, the Marquesas, the Lowe Islands, the Navigator Islands, Easter Island, and New Zealand, with the Sandwich Islands.

Although dispersed over little less than sixty degrees of latitude, and eighty of longitude, the inhabitants of all these islands speak essentially the same language, and approach so near to each other in form, that they must be considered as one race.

In respect to stature, however, there is either some difference between them, or there is some discrepancy in the accounts rendered of it by voyagers; yet it is not material. Freycinet makes the inhabitants of Tahiti 5 feet 8 inches, and those of the Sandwich Islands 5 feet 9 inches high. This is about the ordinary stature of Europeans. Cook who describes the people of the Marquesas as the handsomest of all the South Sea islanders, makes their average height from 5 feet 10 inches to 6 feet, which is making them some 3 inches taller than Europeans.

La Perouse makes the inhabitants of the Navigator Islands from 6 feet and 1 inch to 6 feet and 2 inches high; but he admits that he measured individuals not exceeding 5 feet 8 inches. He describes them as being equally powerful and athletic as tall, and concludes that, compared with Europeans, they are as the Danish horse to the ordinary one of the French provinces. There is, no doubt, however, some exaggeration here; for Captain Wilkes, in his recent

* Voyage autour du Monde. Paris 1829.

voyage, makes their stature only 5 feet 10 inches, and says nothing of their superior strength.*

The other physical features of this race are given by Freycinet and Cook. The first describes the Sandwich islanders as having oval faces, noses a little flattened, small black eyes, large mouths, projecting lips, long lank hair, a little frizzled, very little beard, and a complexion of a clear brown.

Cook says of their colour that it is a "nut-brown," and that "it would difficult to make a nearer comparison, taking in all the different lines of that colour."

In so far, then, as physical form is concerned, there can, I think, be little doubt that this race, so tall and well-proportioned, is a very distinct one from the short and squat Malay, from which it has been gratuitously imagined to be derived.

The varieties of the Negro race, within the scope under consideration, are more numerous than those of the brown complexioned. They have been usually called Papua, which is the corruption of a Malay adjective meaning "frizzled." Some writers have also called them Austral Negroes, evidently an improper appellation, as they are found equally in the northern as the southern hemisphere. Perhaps the name Oriental Negro is more suitable, but that of Negritos, or Little Negroes, applied to them by the Spaniards, is still better.

Beginning from the west, we first find a race of oriental negroes occupying the whole chain of the Andaman Islands, in the Bay of Bengal, between the 10° and 14° of N. latitude. This is a diminutive squat being, not exceeding 5 feet high, of a sooty-black colour, with flat nose, thick lips, and short woolly hair.* Two individuals of this race, whom I saw in Pinang, to which they had been brought by the late General Kydd, who had superintended an attempted British settlement on the Andamans, entirely agreed with this account.

Lately, a race of Negroes has been unexpectedly discovered in the interior of the Nicobar Islands, hitherto believed to have been

* Narrative of the United States Exploring Expedition. London. 1847.
* Syme's Embassy to Ava. 1800.

wholly occupied by the Malay race, but I have seen no account of their personal appearance.

We find a negro race next, in the mountain-chain which runs through the length of the Malay Peninsula. This is known to the Malays, in some parts, under the name of Sámang, and in others of Bila. Those people are of a sooty-black complexion, have woolly hair, and African features. An adult male, measured by my friend General Macinnes, was found to be only 4 feet 9 inches high. This individual was brought from the mountains of Queda. A lad sent to myself, while in the administration of Singapore, by the Raja of Kálantan, a Malay state on the east coast of the peninsula, agreed in complexion, hair, and features, with the description now given.

The great islands of Sumatra, Java, Borneo, and Celebes, are without any negro race of inhabitants; nor is there any record or tradition of their ever having existed. In some islands of the Philippine group, however, they are found in considerable numbers, and are well known to the Spaniards under the name of *Negritos*. Zunigas' description of them is, that they are more of a copper colour than the true African negro, that they have flat noses, soft hair, and are of very low stature. The total number of them subject to the Spanish rule, in the principal island of Luzon, is about 3000.

From all those accounts, I am disposed to conclude, that the Negroes of the Andaman Islands, probably those of the Nicobars, those of the Malayan Peninsula, and of the Philippine Islands, are all of the same race, which would include all the negroes north of the equator. But it must be admitted that this conclusion may not be warranted by a better knowledge than we now possess.

South of the equator, and still within the Malayan Archipelago, we find at least two races of negroes on New Guinea and the islets adjacent to it. One of these has the Negro features, but not in an exaggerated form; and the hair, instead of growing in woolly tufts, is frizzled, long, and bushy, so as to be easily dressed out into the huge mop-like form, of which good representations will be found in the plates annexed to the voyages of the recent French circumnavi-

gators. The stature appears to be about the ordinary one of the Malayan race.

Sir Stamford Raffles brought to England a lad of ten years of age, a native of New Guinea, of the woolly-haired race, of which there is a good representation in the second volume of his History of Java. The late Sir Everard Home described this individual as follows:—"The Papuan differs from the African negro in the following particulars: His skin is of a lighter colour. The woolly hair grows in small tufts, and each hair has a spiral twist. The forehead rises higher, and the hindhead is not so much cut off. The nose projects more from the face. The upper lip is longer and more prominent. The lower lip projects forward from the lower jaw to such an extent that the chin forms no part of the face, the lower part of which is formed by the mouth. The buttocks are so much lower than in the Negro, as to form a striking mark of distinction, but the calf of the leg is as high as in the Negro."*

Both races appear to exist in the island of Wagiou, lying immediately at the north-west end of New Guinea, and most probably there has been here, some intermixture of them. M. Duperry, in the voyage of the Coquille, gives the following description of the inhabitants of this island:—"They are of slender and delicate person, and generally small. Of twenty individuals measured, one only was found to be as much as 5 feet 6 inches high. The average gave only 5 feet 4 inches. In complexion they were less black than the inhabitants of New Ireland, and their features were more regular and agreeable. The facial angle was from 63° to 69°. In some the hair was woolly, like that of the African negro; in some it was lank; and in others intermediate between the two."

After passing New Guinea, we find all the islands lying east of it and of New Holland, up to 170° of east longitude, and from the equator to the tropic of Capricorn, inhabited by men of the Negro stamp, and, as far as they are known, differing so much from each other as to seem to constitute distinct races.

In the voyage of the Coquille, the inhabitants of New Ireland are

* History of Java, by Sir Stamford Raffles, vol. ii.

described as being, in stature, from 5 feet 5 to 5 feet 6 inches, with persons rather slender than athletic—of a colour less black than the African negro, having a facial angle of 66 degrees, and woolly hair, with little beard. They were an uglier race than the inhabitants of Wagiou, within the Archipelago.

Cook describes the inhabitants of Malicolo and of the New Hebrides as a very dark-coloured and diminutive race, with long heads, flat faces, and monkey countenances; their hair as black, short, and curly, but not quite so short and woolly, as that of the African negro, and their beard as short, crisp, and bushy. He pronounces them "an ape-like people," and the most ugly and ill-proportioned he had encountered in the Pacific; "quite a different nation from any other" he had met with in that sea.

Cook's account of Tanna, another of the New Hebrides, makes the inhabitants short and slender, but with good features, and agreeable countenances, having hair crisp and woolly, but longer than that of the inhabitants of Malicolo. At first he was disposed to think them a mixed race between the latter and the Friendly Islanders, but a little acquaintance convinced him they had "little affinity with either."

The isolated New Caledonia, lying between the 20° of south latitude and the tropic, is inhabited by another race of negroes, plainly differing from those already mentioned. Cook describes them as a strong, robust people, some individuals being found as tall as 6 feet 4 inches. Their colour is the same as that of the inhabitants of Tanna, that is black, but not an ebony black. They had, however, "better features and more agreeable countenances." "I observed," says he, "some who had thick lips, flat noses, and full cheeks, and, in some degree, the features and look of a negro." The hair he mentions as very much frizzled, so that, at first, it appeared much like that of an African negro, yet was "nevertheless very different." The hair in fact, appears to be of the same texture as that of some of the inhabitants of New Guinea, and was, like that of these, easily dressed into a hideous mop, as already described.

But we have still another race in the inhabitants of the islands of

Torres Straits. Mr. Jukes describes the inhabitants of Erroob as follows:—"The men were fine, active, well-made fellows, rather above the middle height, of a dark-brown or chocolate colour. They had, frequently, almost handsome faces, aquiline noses, rather broad about the nostrils, well-shaped heads, and many had a singular Jewish cast of features. The hair was frizzled, and dressed into long ringlets. The hair of their body and limbs grew in small tufts, giving the skin a slightly woolly appearance."*

The Australian continent, with Van Dieman's Land, may be considered as coming within the scope of the present inquiry. The Australian approaches nearer to some of the oriental negroes than to any other races of mankind, but is notwithstanding, widely different. One race occupies the whole continent. Its average stature is 5 feet 6 inches, and the colour "almost black." The hair is black, sometimes lank, and sometimes curled, but never woolly. The beard is tolerably abundant and long. The mouth is large, the lips thick, the teeth good, but frequently there is no distinction in the form of the incisors and canine. "Compared with the other races scattered over the face of the globe, the New Hollander appears to stand alone."†

It remains only to notice the inhabitants of Madagascar, very wantonly imagined by some writers to be of the Malayan race, simply because, in the Malagasi language, there have been found a few words of a Malayan tongue.‡ But the people of Madagascar, whether Hovas or ordinary Malagasis, are merely a variety of the African negro, and, neither in colour, features, form, or stature, do they bear any analogy either to the Malayan race, or to any section of the oriental negro.

From the enumeration now made, it will appear that there are no fewer than five distinct races of the brown-complexioned and lank-haired family; and, without including Madagascar or Australia, and

* Narrative of the Surveying Voyage of the Fly. London. 1847.

† Journal of Expeditions of Discovery into Central Australia, by Edward John Eyre. London, 1845. Discoveries in Australia by J. Scot Stokes, Conr. in the R. R. 1846.

‡ Humboldt declares that this language is essentially Malayan in its roots and structure. Ed. J. I. A.

supposing all those to the north of the equator to be identical, not less than eight of that of the oriental negro. As far, then, as physical form is concerned, it is certain enough that none of these widely scattered races could have sprung from one and the same stock, as has been imagined; yet, in most of the many tongues spoken by them, whether brown or negro, traces of a Malayan language are to be found.

A brief examination, phonetical, grammatical, and verbal, or glossarial of some of the principal languages, will, I think, clearly shew that they are generally distinct tongues, not derived from a common stock, and that the Malayan words they contain have been engrafted on them as Teutonic words have been on the continental languages of Europe of Latin origin; or as French words have been on our own Anglo-Saxon, although, indeed, the course through which this has been effected has been, in general, very different.

The languages from which, in my opinion, the words so engrafted have been, for the most part, derived, are those of the two most civilized, numerous, and adventurous nations of the archipelago, the Malays and Javanese. The Malayan words found in each language that has received them will, I think, be found not only numerous, but correct in sound and sense, in proportion to the facilities, geographical, navigable, and lingual, possessed by the parties adopting them, of communication with the parent countries of the Malay and Javanese nations.

The dissemination might be direct from Sumatra and Java, the parent countries in question, or indirectly from some nearer country; and it would happen through commerce, piratical expeditions ending in settlement and conquest, or by the fortuitous wreck of tempest-driven vessels, to all of which I shall, afterwards, more particularly allude.

The Malay and Javanese languages have the same number of vowels, diphthongs, and consonants. The vowels are six in number, viz., *a*, *á*, *e*, *i*, *o*, *u*; the diphthongs two, *ai* and *au*, and the consonants nineteen, *b*, *c*, *d*. *'d*, *g*, *j*, *k*, *l*, *m*, *n*, *n*, *ñ*. *p*. *r*. *t*, *'t*, *w*, *y*,

exclusive of the aspirate, which never begins a word or syllable, and always follows a vowel.

In no part of speech of either language is gender or number expressed by a change in the form of the word; and the only instance of an inflexion is to express a possessive. Relation is expressed generally by propositions.

The only changes which verbal roots undergo, express neuter, transitive, casual, passive, and reciprocal verbs; and this is effected by prefixes or affixes, or both together. Time and mode are expressed by modals prefixed.

It is to be observed that the adjectives expressing gender and number, the propositions expressing relation, the prefixes and affixes applied to verbal roots, and the modals expressing time and mode are, for the most part, different in the two languages, although there be so general an agreement in their grammatical structure.

In these characters, phonetic and grammatical, the other languages of Sumatra, of Java, of Madura, of Bali, of Lombok, and of Borneo agree, but the similarity goes no farther.

I proceed to compare some of the other languages in which Malay and Javanese words are found with those characteristics of the Malay and Javanese languages, and begin with that of Madagascar. Instead of six vowels, this has only four,—*a*, *e*, *i*, and *u*. Instead of nineteen consonants, it has but fourteen, viz., *b*, *d*, *f*, *g*, *k*, *l*, *m*, *n*, *n*, *p*, *r*, *s*, *z*, *zd*. It wants the *c*, the palatial *'d*, and *'t*, *j*, *ñ*, *w*. and *y*, of the Malay and Javanese, but it has *f*, *r*, *z*, and *zd*, which are unknown to these. Like these it has an aspirate; but instead of always following the vowel as in them, it always precedes it.

In Malay and Javanese, words may end in a vowel, a consonant, or an aspirate indifferently. In Malagasi, they can end in a vowel only.

In Malay and Javanese, the liquids *l*, *r*, *w*, and *y*, are the only consonants that coalesce with other consonants; but, with the exception of *r* in a few instances, they never do so in Malagasi. On the other hand, we have in this language combinations of consonants unpronounceable by a Malay or Javanese, as *mp*, *nt*, *nzd*, and

ts, and these, even beginning words and syllables. If the native of Madagascar had invented an alphabet, which like other Negro Africans, they have not done, each of these harsh sounds would, probably, have been considered a distinct consonant, and have had its proper character.

But the grammatical structure of the Malagasi has been adduced as proof that it is a member of what has been called the Polynesian family of languages, in itself a mere hypothesis, and the form of the verb has been especially referred to as evidence.

One form of the Malay, but not of the Javanese transitive verb, is made by prefixing to the root the inseparable particle *má*, the nasals *m*, *n*, *ñ*, and *n*, being substituted for the initial letter of the root as the euphony of the language may demand.

There exists also in the Malagasi a verbal prefix beginning with the letter *m*; but beyond this there is no analogy. The Malagasi prefix, instead of being one, expressing one meaning, amounts to thirteen, expressing as many meanings. We have *mi*, *man*, *mana*, *maha*, *mampi*, *mampan*, *mampampan*, *mifan*, *mifampi*, *mifampan*, *mampampan*, and *mampifampan*. Each of the Malagasi verbs formed by these prefixes has an indicative, an imperative, and an infinitive mood. The indicative has, throughout, a present, a preterite, and a future tense expressed by an inflexion. In four kinds of verbs, the imperative has two forms; and in nine, it has four. In all, the root may undergo 180 changes.

There is nothing analogous to this in the simplicity of the Malay or Javanese verbs. To the copious and elaborate Dictionary of Messrs Freeman and Johns, a most meritorious work, there is prefixed the paradigm of a Malagasi verb, from which I have borrowed my representation of it.* The root in this case, is *sula*, a substitute which, I have no doubt, is the Javanese word *sulur*, meaning the same thing, or "a representative" or "agent," with the loss of its final consonant, indispensable to the genius of Malagasi pronunciation.

The greatest number of changes which any root can be made to

* A Dictionary of the Malagasi Language, by J. J. Freeman. London, 1835.

undergo in Malay or Javanese, does not exceed twelve; and *sulur*, the root in question, could not be subjected even to one half this number, not one of which would correspond in sound or sense with any one of the Malagasi compounds.

The very length of these Malagasi compounds appears to me to be good evidence against the allegation that the Malagasi is of Malayan origin. The great majority of Malay and Javanese roots are bisyllables; but in the Malagasi they frequently extend to four or even five syllables; and when to these are added, not monosyllabic prefixes or affixes, as in Malay and Javanese, but sometimes prefixes or affixes, of two, three, and even of four syllables, the monstrous length of some compounds may readily be supposed From the root *sulu* already mentioned, although only of two syllables, is formed, for example, the compound *mampifampanolo*, which means, "to order to cause to exchange," being a word of six syllables, of which the languages of the Malayan family afford not one example. But words of even double this length may be formed!

I come now to the evidence afforded by words. The Malagasi Dictionary, already quoted, contains about 8000 words, exclusive of compounds. I have gone carefully over it more than once, and can discover no more than 140 which are of Malayan origin, which would make about $\frac{1}{57}$th part of the language.

But to the dictionary is appended a list of words especially called roots. These amount to 500; and among them I find just six Malayan words, and no more.

The nature of the Malayan words found in the Malagasi, is of much importance in the inquiry. Sixty are the names of natural objects, and thirteen are numerals. There is no preposition among them, no auxiliary verb, nor any other word essential to the structure of a sentence. The language, in a word, might be written or spoken without them, with far more ease, and that is not difficult, than good English can be written or spoken without the assistance of the Norman-French portion of it.

The Malayan words received into the Malagasi are, with few exception, corrupted in sound, a result to be expected from the differ-

ence between the phonetic character of the languages. The corruption extends both to vowels and consonants. There are also corruptions of sense, although not so frequent.

Of the 140 Malayan words, 42 are exclusively Malay, 15 exclusively Javanese, and 73 common to these two languages, while two are, I think, Bugis. The number is completed by eight, suspected to be Sanscrit, of which six are tolerably certain. These Sanscrit words are popular in the languages of the Indian Archipelago, and have every appearance of having been received into the Malagasi through this channel.

All this will, I hope, be considered a sufficient refutation of the hypothesis, that the language of Madagascar is of the same stock with the Malay.

Passing over the languages of Sumatra, Java, Madura, Bali, and Borneo, which, in phonetic character and grammatical structure, bear much analogy to the Malay and Javanese, I shall take for my next example, the most cultivated, and widely-spoken of the languages of Celebes, that of the Bugis, called by themselves Wugi. This is a written tongue, with a peculiar native character, and differs essentially from the Malay and Javanese.

I am enabled to render some satisfactory account of the Wugi, from possessing a vocabulary of it in the native character.* The vowels of the Wugi are seven in number, *a*, *e*, *i*, *o*, *u*, *ö*, *ü*. According to the author of the vocabulary, the *ö* has the same sound as this letter in the German word Königberg, and the *ü* is the *u* of the French. The *á*, equivalent to our commonest sound of *u*, so frequent in the Malay and Javanese, is wanting. The dipthongs are the same as in Malay and Javanese, viz, *ai* and *au*.

The Wugi consonants are 15 in number, instead of 19, as in Malay and Javanese. They are as follows: *b*, *c*, *d*, *g*, *j*, *k*, *l*, *m*, *n*, *n*, *p*, *r*, *s*, *t*, *w*. It wants the palatial *·d* and *·t* of the Malay and Javanese, with *ñ* and *y*. The nasal *n* has no representative as a consonant in the alphabet; it follows a vowel only, and is marked by a

* A Vocabulary of the English, Bugis, and Malay Languages, containing about 2000 words. Singapore, 1833. (By the Rev. Mr. Thomsen.)

point over the preceding letter. The sharp aspirate *h* is ranked among the consonants, and may precede or follow a vowel. The letter *k*, at the end of a word, is used as a soft aspirate; and, with this exception, that of the aspirate and nasal *n*, every Bugis word must end in a vowel or diphthong. Thus the Malay word *mawar*, a rose, becomes *mawara*, and *rampas*, to plunder, by a double elision, and the substitution of a diphthong for a vowel, *rapai*.

The grammar of the Wugi is extremely simple. Gender and number are expressed by native adjectives; and relation of nouns by prepositions, differing, however, wholly from those which act the same part in Malay and Javanese, which is the same thing as saying of languages of complex structure that their declensions are wholly different.

The Wugi has native pronouns of the first, second, and third persons; which last, it may be noticed, are wanting in the Javanese. It has also pronouns expressing plurality.

Neuter verbs, adjectives, and participles, are formed from roots, which are usually nouns, by the prefix *ma*, evidently a different thing, in sense and sound, from the transitive prefix *mú* of the Malay. The word *hosi* means "rain," and *mahosi*, "to rain," Puti is the noun "white," and *maputi*, the adjective "white," or the verb "to be white." Transtive verbs are formed by the affix *i*, according to one of several forms for such verbs in Malay, but not Javanese. Thus, *göncin* is "a pair of scissors," and *goncini*, "to shear or clip."

An examination of 1777 words of the Wugi vocabulary gives the following results. The number of 1352 are native words; 109 are Malay; 16 are Javanese; and 300 are common to these two languages. The proportion of Malayan words to native, therefore, is less than 24 to 76 in 100, or less than a fourth part of the whole.

I may add, that in 1810 words, there are in the Wugi 33 words of Sanscrit, being the same that are popular in the Malay and Javanese, and not improbably introduced through them.

From this account it will be seen, that the Malayan words in the Bugis language form something like a similar proportion to the native portion of it that the French does to the Anglo-Saxon in our

own language; and it may safely be added, that it is not more essential to its structure.

The great alterations generally effected in the form of Malayan words introduced into the Wugi, seem to me plainly to attest their foreign origin. We find in them, changes by permutation, both of vowels, and consonants, changes by addition of vowels and changes by elision of consonants. I shall only give two or three examples. *Kayu*, wood, is in Wugi converted into *aju*, by the loss of the first consonant, and the conversion of the second, which does not belong to the Wugi, into *j*. *Lutut*, the knee, and *kulit*, skin or rind, become in Wugi, *utu*, and *uli*, by the loss both of their initial and final consonants. *Cármin*, a mirror, becomes *cami*, by the change of *á* for *a*, the elision of the *r*, which would not be followed by another consonant without the intervention of a vowel, and the elision of the final consonant, which is one that could not end a word.

The same inference of a foreign origin is, I think, to be deduced from the nature of the Malay and Javanese words found in Wugi. Among these, there are 240 nouns, 35 adjectives, 85 verbs. Among the 52 pronouns of the Bugis, I can discover but three that can be suspected Malay or Javanese. In 69 adverbs, I find three only that are of these languages; and out of 16 conjunctions, and 26 prepositions, there is but one of each that belongs to them.

The languages of the Philippine islands from a peculiar group, differing very essentially from the Malay and Javanese. Several of those of the great island of Luçon have received a large amount of culture, and, like the principal languages of the western portion of the archipelago, are written tongues, with a peculiar and distinct alphabet.

This alphabet, the same for all the languages. has five vowels—*a*, *e*, *i*, *o*, *u*; and 4 diphthongs—*ai*, *ao*, *au*, and *ui*; with sixteen consonants, beside the aspirate, viz., *b*, *d*, *g*, *j*, *k*, *l*, *m*, *n*, *ñ*, *n*, *p*, *r*, *t*, *w*, *y*. Of the vowels, therefore, it wants the *á* of the Malay and Javanese, while it possesses two diphthongs, which these have not. Among the consonants, it has all those of the Malayan languages except the sound *c*, and the palatal *·d* and *·t*.

Words or syllables, in the Philippine languages, may begin with the aspirate, but not end with it, which is exactly the reverse of what obtains in the Malay and Javanese.

In the Philippine languages words may end, and very generally do, in consonants, as obtains in the Malay and Javanese, but contrary to usual practice of the languages of the neighbouring island of Celebes. No consonant coalesces with another in the Phillippine languages, with the exception of the liquids *r* and *l*, and these not often.

In the Philippine languages, certain consonants follow others without the intervention of a vowel, which in Malay, and Javanese are never found to do so. The letter *g*, which very rarely ends a Malay or Javanese word, is a very frequent termination of Philippine ones. Of these two peculiarities the following are examples from the Bisaya language :—*Lobtog*, a jar ; *yagbak*, a rat ; *toltog*, to *pound* ; *tag*, lord or master ; *tuig*, time ; which are sounds utterly repugnant to Malay or Javanese pronunciation.

Between the grammatical structures of the Malay and Javanese and the Philippine languages, there is a very wide difference. In order to illustrate the extent of it, I take the grammar of the Pampanga, one of the six principal languages of Luçon, for an example.*

The noun is simple, or without any inflexion. As the author of the grammar says, it undergoes no more change than the Latin word *genu*. Relation, or case, is expressed by what the Spanish author of the grammar calls an article. This varies, or, more correctly, is a different word for each case. There is, besides, one kind of article for apellatives, and another for proper names.

If the words thus called articles by the Spaniards be, as is probable, only prepositions, then it must be observed that they bear no resemblance to any prepositions of the Malay or Javanese.

A still wider difference exists in the pronouns. The personal pronoun of the first person has two genitive cases, and three plurals:

* Arte de la lengua Pampanga por Diego Bergaño. Quarto. Manila, 1736.

a dual, "we two;" a plural general, "we all;" and a plural particular. "we in particular."

The pronouns of the second and third persons have but one plural. The demonstrative and interrogative pronouns have also one plural only.

Adjectives are formed from roots, as in the Wugi of Celebes, by the prefix *ma*.

The verb, according to the Spanish author of the grammar, is of considerable complexity, and has several conjugations. Its moods and passive forms are formed by auxiliaries, but its tenses by inseparable prefixes. One portion only of the Pampanga verbs resembles the Malay and Javanese, or, at least, one form of these. This is the verbal noun which is formed by the affix *an*, added to the root.

In order to find the proportion of Malayan words in the Philippine languages, I have carefully gone over two dictionaries of the most prevalent of them, the Tagala and Bisaya of Luçon,* the last of which has spread to Majindanau and the Sulu group.

The Tagala dictionary contains above 12,000 words, but, excluding compounds, about 7700. Of these 77 are Malay, 20 are Javanese, and 156 are common to these two languages. This makes the whole number of Malayan words 253, which gives the proportion of about 32 in 1000. The Tagala Dictionary contains also 24 words of Sanskrit, which, I have no doubt, found their way into the language through the Malayan tongue, for they are all found, and with the same meaning, in Malay and Javanese.

The Bisaya Dictionary contains 9000 words, of which 72 are Malay, 17 Javanese, and 197 are common to those languages, making, in all, 286 Malayan words, or about 30 in 1000—a proportion not very different from that of the Tagala. The Bisaya contains also Sanscrit words, but I can find only 13.

The Malayan and Javanese words introduced into the two Phi-

* Vocabulario de la lengua Tagala compuesta por N. H. Fray Domingo de los Santos. Fol. Tagaleas, 1703. Vocabulario de la lengua Bisaya por el R. L. Matheo Sanches. Fol. Manila, 1711.

lippine languages have often undergone great corruptions, both in sound and sense. Thus, the word *báli*, or "*bli*" "to buy," in Malay, is written *bili* in Tagala, and interpreted "price," or "cost." *Buna*, in Malay, is "a flower" or "blossom," and in Tagala it is "fruit." *Pintu*, in Malay and Javanese, is a "door" or "gate;" but in Tagala, written *pinto*, it means "a house." *Luban*, in Malay, is a "hole," "aperture, or "pit:" and in Tagala, written *luhun*, it signifies "interment," and "a grave." *Utan*, in Malay, means "a forest" or "wild;" but in Tagala, "foliage" and "verdure."

Sometimes one of the Philippine languages gives the sense more correctly than the other. Thus, the Malay word *bau*, "odour" or "smell," is, in Tagala," "stench" or "bad smell," while in Bisaya the Malay sense is correctly given. In Malay and Javanese, the word *tali* signifies "a rope," "string," or "cord," but in Bisaya it is "a sash;" while in Tagala it is correctly rendered. *Nana*, "to gape," in Malay, is, in Tagala, "to open," "to masticate," "to eat;" while in Bisaya it signifies "to open the mouth," making a nearer approach to the true meaning.

The Sanscrit words introduced into the Philippine language have been equally corrupted with the Malayan. Thus, the word *cinta*, "affection," is correctly written in Malay and Javanese, but in the Tagala and Bisaya the letter *c* not existing, *s* is always substituted for it, and *cinta* becomes *sinta*.

The well-known Sanscrit word *Avatar*, meaning "descent," and commonly applied to a descent or an incarnation of Vishnu, is corrupted in the Malayan languages into *Batara*, and not confined to the incarnations of Vishnu, but applied as a generic term to any of the chief Hindoo gods. This is the sense in which it was used by the Philippine islanders on the arrival of the Spaniards, but by a permutation that is frequent with words introduced from the Malayan, *l* is substituted for *r*, and an aspirate being added, the word has become *Bathala*.

The Spanish missionaries found this word ready to their hand, and applied it as an appellative to the Deity; so that, by a strange

coincidence, among the native Christians of the Philippines, the Hindoo *Avatar* comes to be the translation of the Jehovah of the Jews, and the Dio of the Spaniards.*

The nature of the Malay and Javanese words introduced into the languages of the Philippines, points, I think, plainly enough to their foreign origin. Of these found in the Tagala, nearly one-half are substantive nouns, or names, of things. The pronouns amount only to two, the adjectives only to five, and there is but a solitary preposition. In a great majority of cases the Malay and Javanese words are only synonymes, and the language could not only be written with ease without them, but suffer little by their omission.

I come next to the languages of the Pacific. A language, essentially the same, is spoken in the Sandwich, the Society, the Marquesas, and the Friendly Islands, the Low Islands, Easter Island, and New Zealand—that is, from the Tropic of Cancer to the 46° of south latitude. This is one of the most extraordinary phenomena in the history of language; and there is certainly nothing parallel to it, either within the Pacific itself, or the islands of the Indian Archipelago.

To illustrate this language, I shall take the Tahitian and New Zealand dialects for examples, good grammars and dictionaries of both having been published.† The French have called this widespread language the Oceanic, and other European nations the Polynesian, which last, as most general, I shall adopt.

The vowels of the Polynesian, as exemplified in the New Zealand, are five in number—*a*, *e*, *i*, *o*, *u*,the dipthongs—six *ae*, *ai*, *ao*, *ei*, and *ou*; and the consonants only eight—*k*, *m*, *n*, *ng*, *p*, *r*, *t*, *w*, exclusive of the aspirate. Thus it has one vowel less than the Malay

* Baron William Humboldt, in his great work the Kawi Sprache, seems to consider the Philippine languages as exhibiting the supposed great Polynesian language in its greatest purity, but on what ground I am not aware. As far as my judgment goes, the words in common are greatly-corrupted Malay and Javanese.

† A Grammar of the Tahitian Dialect of the Polynesian Language. Tahiti 1823. A Dictionary of the New Zealand Language, and a Concise Grammar, by William Williams, Archdeacon of Waiapu. Paihia, 1844. Vocabulaire Oceanien-Français et Français-Oceanien. Par L'Abbe Boniface Mosblech. Paris, 1843.

and Javanese, and three times as many diphthongs, while it wants no fewer than eleven consonants of the Malayan series.

The aspirate is largely used and in a manner contrary to the usage of the Malay and Javanese, for it must always precede, but never follow, a vowel—consequently never end a word or syllable.

Every syllable and every word must end in a vowel, and when foreign words are introduced ending in a consonant, the consonant is either elided, or a vowel added. No consonant ever coalesces with another; or, in other terms, a vowel or diphthong is always interposed between two consonants.

The paucity of consonants, and the frequency of vowels and diphthongs, necessarily convey to a stranger a sense of monotony and feebleness. Thus, the word "to shiver with cold," *kauaehanuru*, notwithstanding its length, contains but two consonants. *Tiahuahu*, "to distribute" or "scatter about," and *puhihihi*, words each of eight letters, have but a single consonant a-piece. These are sounds so utterly repugnant to the genius of Malayan pronunciation, that a Malay or Javanese could hardly articulate them.

The grammar of the Polynesian language is nearly as widely apart from that of the Malay or Javanese as its phonetic character. The Polynesian has two articles, parts of speech unknown to the Malay and Javanese, but bearing some analogy to those of our own language. The cases of nouns are expressed, not by inflexions, but prepositions, which, however, differ wholly from those which serve the same purpose in the Malay and Javanese languages.

The noun has a plural, formed by the inseparable prefix *na*. Gender is designated by adjectives; but these differ not only from those of the Malay and Javanese, but from those of every other language of the Archipelago that I have examined.

One of the most remarkable differences between the Malay and Javanese languages on the one hand, and the Polynesian on the other, consists in the latter having a singular, a dual, and a plural number to its pronouns of the second and third persons. The only languages of the Archipelago that have something resembling this peculiarity, are those of the Philippines; but here it is the pronoun

of the first, and not of the second and third persons that have numbers.

The Polynesian verb differs entirely from the Malay and Javanese. The simplest form of it is the neuter or active verb, which may be considered the root. This is made causal by the prefix *waka*, and passive by the affix *a*. The moods are formed by particles; and the tenses, of which there are six, by the help of prefixes, affixes, or adverbs. A verbal noun is formed by adding to the root the inseparable particle *na*, under certain rules of euphony.

The New Zealand Dictionary contains about 6000 words; but omitting derivatives, about 5500. I have carefully gone over it, and can discover in it only 107 words belonging to the Malayan languages. Of these 24 are Malay, 16 Javanese, 59 common to these two languages, and 8 belonging to the Bugis or Wugi of Celebes. The proportion, then, of Malayan words in the Polynesian, to judge by the dialect of New Zealand, is less than 20 in 1000.

There are two words in the New Zealand which may possibly be Sanscrit. *Apiti*, "to join," may be the word *apit* of the Malay and Javanese, taken from the Sanscrit, and meaning, "close, pressed together;" and *tapu*, the well-known *tabu*, may be the *tapa*, or religious penance of the Hindoos, found in almost every language of the Indian Archipelago. The addition of the vowel, in the case of *apit*, has already been explained; and of the permutation of the final *a* into other vowels, we have in the Polynesian, several examples, as *kapu*, "an axe," for *kapak; tanu*, "to bury," for *tanam; ono*, "six," for *anam;* and *rami*, "to squeeze," for *ramás.*

From the wide discrepancy which exists between the phonetic system of the Polynesian and Malayan languages, the words of the latter introduced into the former, are of course, greatly corrupted in form. The Malay and Javanese word *api*, "fire," becomes, for example, *ahi; Buah*, "fruit," becomes *hua; minum*, "to drink," *inu; salah*, "a crime," *hara; papan*, "a boar," *papa; tahun*, "a year," *tau;* and *daun*, "a leaf," *rau.*

Corruptions in sense are also frequent. *Mata*, "the eye," in Malay and Javanese, means "the face" in the New Zealand. In

the Marquesas, however, this word has the correct meaning of "the eye," as well as the improper one of "the face," Although this word, however, in its literal sense is misapplied, it is remarkable that, in some of its figurative meanings, it is correctly used, as for the "mesh of a net," "the point" or "blade" of a weapon, and "a spring" or "fountain." *Batu* or *watu* is a stone in Malay and Javanese, but in the New Zealand it means "hail" and the "pupil of the eye," figurative senses of it in the two first languages. *Rahi*, in Javanese, means "the face," but its literal meaning in the New Zealand is "forehead," and its figurative "a promontory."

The Malayan words which have found their way into the Polynesian, are far too few and unimportant to form an essential portion of the language, the grammatical structure of which is complete without reference to them. In point of number, in fact, they do not exceed that of the English introduced, within the last thirty years by the English and American missionaries, into the dialects of the Marquesas and Sandwich Islands.* These last, too, it may be added, have undergone the same inevitable mutilations. Thus, to give a few examples, a book has become *puke;* paper, *pope;* school, *kula;* bread, *palena;* powder, *paora;* a shoe, *hiu;* the cow, *pifa*, (beef); the sheep, *hipa;* riches, *mamona* (mammon); and a church (*ecclesia*), *helipulue.*

Although the dialects of New Zealand, of Tahiti, the Marquesas, Friendly, and Sandwich Islands, are admitted by competent judges to be the same language essentially, there still exist between them some material discrepancies, both as to sound and words.

Thus, in the Tahiti, there are nine consonants, instead of eight, as in the New Zealand. It has *b*, *d*, *f*, and *v*, which the last wants; while it wants *k*, *n*, and *w*, which the New Zealand has. The Marquesá has but seven consonants, viz. *k*, *m*, *n*, *p*, *t*, and *v*; and the Sandwich Island is the poorest of all, for it has but six, viz. *k*, *l*, *m*, *n*, *p*, and *v*.

* "Vocabulaire Océanien-Français-Océanien par L'Abbe Boniface Moshlech. Paris, 1833." This work appears to be drawn from good materials, and is exceedingly well executed.

The proportion of Malayan words in the Marquesa and Sandwich Islands dialects is smaller than in the New Zealand. Most of those words are the same, although often much altered in form; but I find at least twenty words of Malayan in the New Zealand not existing in the other two dialects. The pronunciation is also most correctly given in the New Zealand, and least so in the Sandwich Island.

The language of the Feejee islanders was, for some time, considered to be different from the great Polynesian, but is now well known to be only a dialect of it. I have seen no vocabulary of it of sufficient length to enable me to form any judgment of it. Its alphabet, however, has been correctly given, and this consists of the usual five vowels, and not of six or nine consonants like the Polynesian, but of fifteen, viz., *b*, *d*, *f*, *g*, *j*, *k*, *l*, *m*, *n*, *n*, *p*, *r*. *s*, *t*, and *v*, which, for variety of intonation, puts it on an equality with the Wugi of Celebes, although it leaves it, by four letters, short of the Malay and Javanese.* The Feejee language contains Malayan words, like the other languages of Polynesia; but in what proportion I am not aware.

Our materials for forming a judgment of the languages of the Negro races are, as might be expected, from the rudeness or the ferocity, or remoteness of these tribes, extremely imperfect. One of the longest lists of words of any of their languages which I have seen, is one furnished to myself, in 1811, by the then minister of the Raja of Queda. It is of the language of the Sámang of the Járai, one of the highest of the mountains of the Malay Peninsula. It consists of 176 words, to which I add twenty-one of the language of the same people, from the work of Mr. Marsden.†

The phonetic system of the language of the Sámang is not very remote from that of the Malay and Javanese; but it seems to abound more in aspirates, gutturals, and monosyllables. Syllables and words

* Introduction to a Grammar of the Tahitian Dialect of the Polynesian Language. Tahiti, 1833. An Australian Grammar, &c. &c., by L. L. Threlkeld. Sydney, 1843. Narrative of the United States' Exploring Expedition, 1847.

† "On the Polynesian and East Insular Languages." Miscellaneous Works. 1831.

may end with vowels or consonants, but do so, most frequently with the latter.

In the 197 words to which I have alluded, I find that 156 are native, that fifteen are Malay, two Javanese; that twenty-three are common to these two languages, and that one word only is Sanscrit. The proportion of Malay and Javanese words, therefore, is nearly eighteen in 100, but its amount is exaggerated by the numerals which are nearly all Malayan.

As in the case of the languages of the brown-complexioned races, the existence of the Malay and Javanese wo rds may be considered as in a great measure fortuitous; and neither in character or number can they be considered as forming any necessary part of the Sámang language.

I have compared, with this specimen of the language of the Sámang, the few words given by Colonel Colebrooke, in the Asiatic Researches, of the language of Andaman Islands, and the result is that no two words are alike, and that the latter contains no word of Malayan origin.

De Dontrecasteaux* has given a list of 103 words of the Negro language of Wageou, lying off the north-west end of New Guinea, as already alluded to. To judge by the appearance of this list, it seems to embrace all the sounds found in the Malay and Javanese, but it contains, besides, two letters, *f* and *z*, which are unknown to these. The 103 words contain eighteen which are also found in Malay and Javanese. Of these ten are numerals, greatly corrupted; two are synonymes, occuring with native terms; one is Tálugu, and one Portuguese, both, no doubt, derived through the Malay.

On comparing the native portion of the language of Wageou with that of the Sámang, and the words of the Andaman, no resemblance can be found between them.

De Dontrecasteaux gives another list of the language of a Negro people who visited the French ships while they lay at Boni harbour in Wageou, and whom he describes as having flat noses, very thick

* Voyage autour du Monde. Paris, 1808.

lips, and short woolly hair. Every word of this language, which he supposes to be of New Guinea, differs from that of Wageou; nor does a single word of Malay and Javanese occur in it.

M. Duperry has given the ten digits of three Negro languages, two of New Guinea, and one, that of New Ireland. In the first in order of those of New Guinea, the numbers 5, 6, and 10, are Malayan, greatly corrupted. The second, said to be that of the inhabitants of the interior, does not contain even one word that is Malayan. But in the language of New Ireland we find the numbers 3, 4, 5, 6, 8, 9, and 10, all Malayan.

Forster* has thirty-three words of the language of Malicolo, one of the New Hebrides, the population of all which group appears to be Negro. Cook observes, that the people of Malicolo "seemed to be quite a different nation from any we had yet met with, and speak a different language. Of about eighty words collected by Mr. Forster, hardly one bears any affinity to the language spoken at any of the islands I had ever been at. I observed that they would pronounce most of our words with great ease. They express their admiration by hissing like a goose."†

The words given by Forster accord with this description of its phonetic character. They imply 12 consonants instead of the meagre numbers of the Polynesian dialects. These are *b*, *d*, *g*, *k*, *l*, *m*, *n*, *ŋ*, r, *s*, *t*, and *y*: and they are combined in a manner, not only unknown to the Polynesian, but to the Malay and Javanese, as *db*, *ts*, and *rg*.

Among the thirty-three words there are three which are corrupted Malayan: the words, for "eye," "ear," and the verb "to die," which last, however, instead of *mati*, is *mats*.

Another Negro language is that of Tanna, also one of the New Hebrides. Forster gives forty-one words of it. Cook observes of it: "It is different from any we had before met with, and bears no affinity to that of Malicolo: so that it would seem the people of this island are a distinct nation."‡

* Forster's Observations on Cook's Voyage, 1778.
† Cook's Second Voyage. ‡ Ibid.

To judge by the list of words, the Tanna has thirteen consonants, several of which differ from those of the Malicolo. They are *b*, *f*, *g*, *k*, *l*, *m*, *n*, *n*, *p*, *r*, *s*, *t*, and *v*. The words abound more in vowels than the Malicolo, and the harsh combinations of them existing in the latter are absent.

There are but two words in the Tanna which are the same as in the Malicolo, those for the verb "to drink," and for "a house." There are six Malayan words, viz., that for "a cocoa-nut," for "land or country," for "the sea," for "fish," and for "a chisel," which last is erroneously translated by Forter, "hatchet." I can find in it only one word of the Polynesian, that for "chief," or "priest."

Of the language of New Caledonia, Forster has given thirty-eight words. This seems to have twelve consonants, differing in some respects both from those of Tanna and Malicolo. They are *b*, *g*, *k*, *l*, *m*, *n*, *n*, *ñ*, *p*, *r*, *t*, and *w*. Cook considers this language as a mixture between that of Tanna and the Polynesian. I do not find one word in it in common with the Tanna, except such as both have borrowed from other languages. Those common to it with the Polynesian are the verb "to eat," the word for "moon," and the words for "chief," or "priest," which last it has in common with the Tanna.

The Malay words contained in the New Caledonia are five in number,—that for "a cocoa-nut," for "the ear," for "fish," for "water," and for "a yam,"—all in a corrupt form, as *nu* for *ñur*, a cocoa-nut; *galina* for *talina*, the ear; and *ufi* for *ubi*, a yam.

Not one of the three Negro languages just mentioned contains a word that is common to the Negro languages before enumerated, except such as all have derived from a third source, the Malayan.

To this meagre list of the Negrito languages, I have to add the more copious ones furnished by Mr. Jukes, of the language of the Torres Straits islanders. The vocabularies which he furnishes are six in number, and amount to from 37 words up to 545. The vowel sounds appear to be *a*, *á*, *e*, *i*, *o*, *u*, and the diphthongs *ai* and *au*, which agrees exactly with those of the Malay and Javanese. The

consonants seem to be *b*, *c*, *d*, *g*, *k*, *l*, *m*, *n*, *p*, *r*, *s*, *t*, *v*, *w*, and *z*, together with a sound represented by Mr. Jukes as *dh*, *dz*, and *j*. If there be such sounds, it is clear that these are really three distinct consonants, and that if these people had invented an alphabet, each would have its distinct character. If this be the case, there are 18 consonants, over and above the aspirate, which these languages have.

In all these languages, I find but one word which is Malay, and even this is confined to a single language, that of Masseid or York Island. This is *maruk*, which the natives applied to the domestic fowl which they saw in the hen-coops of the Fly, for they have none of their own. The word is, no doubt, a corruption of the widespread Malayan *manuk*, and probably borrowed from New Guinea, which the natives of the islands of Torres Straits appear sometimes to visit. There are two other words which are very doubtful. In two of the languages, the cocoa-nut is called *boonarri*, which may be a corruption of the Malay words *buah ñur*, or the fruit of the cocoa-nut; and in a third the same object is called *woo* which may be a corruption of the Malay *buah*, or in Javanese *woh*, "fruit" or "the fruit."

Comparing the languages of the islands in Torres Straits with those of Malicolo, Tanna, and New Caledonia there are certainly no two words in common between them. Even the numerals are wholly different; and while the Polynesian negroes count as far as 10, the Torre's Straits islanders can proceed no further than 6, and even this only by multiplying one and two.

From the details which have now been given, it will be seen that Malay and Javanese words, as I stated before, have found their way into the languages of the Archipelago and Pacific, or other neighbourhood, in proportion to facility or difficulty of communication with the parent countries of these two languages, Sumatra and Java. The facilities and difficulties have consisted—of proximity or distance, geographical and navigable; of similarity or dissimilarity of race,—of similarity or dissimilarity of lingual idiom, and of attraction or repulsion from disparity in the condition of civilization.

The influx of Malay and Javanese words will be found large in

the proportion of the facilities; and small as they diminish, until, by an accumulation of difficulties, they cease altogether.

Malay and Javanese words have not been traced to the languages of the continents of Africa and America. Madagascar seems to intercept them from the first, and the want of stepping-stones or stages between Easter Island and the west coast of America, with adverse winds and currents, from the last.

Wherever they have been received, the Malays and Javanese will be found in a higher state of civilization than the nations into whose languages theirs have been adopted. Wherever, on the contrary, the nations with whom they have held intercourse have been in a higher state of civilization than themselves, their languages have been rejected, and the languages of those nations even adopted into their own.

The Hindoos, in a higher state of civilization than the Malays and Javanese, have wholly rejected their languages; but, on the contrary, in the course of an intercourse of many ages, the latter have borrowed largely,—of which, if this were the proper time, I could, through the friendship of the learned and ingenious orientalist now presiding over this section, furnish larger and more satisfactory evidence than has ever been adduced before.*

The same cause has excluded the Malay and Javanese from the languages of Arabia and Persia, notwithstanding an intercourse of at least five centuries; while, on the other hand, those languages have been, to a considerable extent, largely adopted both by the Malays and Javanese.

Superior civilization, and probably not less, the uncongenial monosyllabic character of their languages, has excluded the Malayan languages from the regions east of Hindustan. The Siamese, although in immediate juxtaposition with the Malay, has neither given the latter words, nor, with the exception of about half a dozen, received any from it.

This remark is still more applicable to the Chinese languages,

* Horace Hayman Wilson, Professor of Sanskrit in the University of Oxford.

which have not only borrowed nothing from the Malayan languages, but conferred little or nothing on them, notwithstanding the intercourse and settlement of centuries.

It is a striking fact, that not a word of any Malayan language is to be found in any of the many languages of Australia. I should have expected them, for example, in the language of Raffle's Bay, which is close to the stations frequented, probably for many ages, by the Tripang fishers of Macassar; but there is not a word to be found in it. This is not to be accounted for by difference of race or difference of idiom, for the languages of the Negro races of the Archipelago contain Malayan words; and so does that of the far more distant Easter island, of which, in so far as pronunciation is concerned, the genius is more remote from the Malayan than is that of the Australian.

The absence from the Australian languages of all trace of the Malayan, can, I think, only be accounted for by the very low social condition of the Australian race, which seems, as if it were, to have repelled all knowledge derived from a superior one.

In order to shew the proportion in which Malayan words are found in the various languages which have received them, I give a few examples. In the Madura, one of the two languages of the island of that name, in 1000 words, it is 581; in Sunda, one of the two languages of Java, it is 526; in Lampung, one of the six languages of Sumatra, it is 516; in the Wugi, one of the many languages of Celebes, it drops down to 233; in the Tagala of the Philippines, it is but 33; in the New Zealand, it is but 20; and in the Malagasi, but 17.

A few instances occur of the languages of tribes so situated that we might fairly expect them to contain a considerable portion of Malay and Javanese, but which really contain very little. The most remarkable example of this is the Tambora of Sumbawa. This island is only the third from Java, and nearly in the centre of the Archipelago, while the people who speak the language are of the brown-complexioned lank-haired race, like those who speak two other languages of the same island, both containing a large influx of Malay

and Javanese, yet out of forty-eight words, the Tambora contains but two words, *bulu*, "a hair," *makan*, "to eat."*

Another example, although not so striking a one, is afforded by the language of the Pelew or Pilu Islands, inhabited by a brown-complexioned and lank-haired race, and not more than eight degrees east of the Philippine group. In 658 words of it, I can discover only three which are Malayan. Yet a considerable number of Malayan words are found in the language of the Bashee Islands, and in that of the native inhabitants of Formosa; and a still larger in the Sandwich Island dialect of the Polynesian, ten times as far from the Philippine as the Pelew group.†

An argument in favour of one original tongue has been attempted to be deduced from the supposition that the Malayan words, so widely dispersed, express, in most cases, the simplest and earliest ideas of mankind. My friend the late Mr. Marsden, with his usual good faith, has given a list of 34 such words in 72 languages, on which, with other words of the same imagined class, I shall offer a few observations.‡

Among the words imagined to express a simple and primitive class of ideas, the numerals have been much insisted on. It is obvious enough, however, that the numerals, especially a decimal series of them extending like the Malayan, to 1000, are far from being words expressing such a class of ideas. On the contrary, they must be the invention of a comparatively advanced period of civilization. Thus, among the many languages of Australia, the inhabitants of which are far below the humblest of those of the Indian and Pacific islands, there is not one that has numerals going beyond "four," and even the last number is attained only by doubling a dual.

But there are some languages of the Archipelago and Pacific Is-

* It was in the country of the people of Tambora that took place the greatest volcanic eruption on record, that of 1814; and the nation is said to have been nearly destroyed by it.

† Account of the Pelew Islands from the Journals of Captain Henry Wilson, by George Keate, Esq. London, 1788.

‡ "On the Polynesian or East Insular Languages." Miscellaneous Works. 1831.

lands, and this of the brown-complexioned race, which have preserved their own native numerals entire. This is the case with the language of Tambora in Sumbawa, with the Ternati, and the Tidori, two of the languages of the Moluccas, as well as with the language of the Pelew Islands.

In some languages, again, the native numerals have been preserved as far as "three" or "four," and the series completed with the Malayan, as in the Gorongtalu of Celebes, and the Mangarai of Floris.

The same is the case in the languages of the Negroes as in those of the brown-complexioned men. Some have adopted, and some rejected the Malayan system. The Negroes of Wageou, and of the coast of New Guinea, with the natives of New Ireland within the Pacific, have, to a greater or less extent, adopted the Malayan numerals, while the Sámang of the Malay Peninsula, the Alfours of the interior of New Guinea, the people of Malicolo, of Tanna, and of New Caledonia, have each their own native system, unaffected by the Malayan.

Some languages have numerals as far as "five," and clumsily continue the series of digits from their native resources, by adding "one," "two," &c., to the last named number, so that six is expressed by "five" and "one," and "seven" by "five" and "two." This is the case with the New Caledonia.

Others seem to have relics of a binal scale, and combine it with the Malayan decimal one, as in the Endé of Flores. In this, for "one," "two," three," and "five," the Malayan terms have been adopted, but instead of being continued beyond this, "six" and "seven" are expressed by the Malayan words "five and one" and "five and two." Four is expressed by a native word, and the Malay numeral "two" prefixed to it expresses "eight," that is, "two fours."

The native Malayan system extends only to 1000, and even to this extent, it is not carried by all the tribes that have adopted it. It is doubtful whether the terms for *ten* and for *hundred*, in the different dialects of the Polynesian, and which differ among them-

selves, are Malayan; the word for thousand, *mano*, certainly is not. In the Lampung of Sumatra, a written language, the term for this last number is the same which means an "iron nail or spike."

For the numbers above 1000, the Malayan system has borrowed from the Sanscrit; and the Javanese, but it alone, goes as far with the higher numerals as "ten billions." There are two remarkable misapplications of the Sanscrit numbers: the Laksa and Kati, the well-known *lac* and *krore* which ought to express a hundred thousand and ten millions, express, through all the cultivated languages of the Archipelago, "ten thousand" and "a hundred thousand" only.

From the explanation now given, I think it must be sufficiently obvious that the Malayan numerals afford no evidence whatever of the existence of one great original language. They seem simply, and as opportunity offered, to have been adopted as a matter of convenience—in some cases in their entireness, but for the most part only partially.

Among the words of Malayan most generally diffused, and considered to be of the class representing the most simple and primitive ideas, are the terms for "man," "bird," "fish," &c.; but these are obviously general or abstract terms, and, necessarily, could not have been among the first invented. The Australians, according to Mr. Eyre, have no such terms.* It may be conjectured, indeed, that the want of them in the ruder languages, both of the Archipelago and Pacific, is one cause of the frequent occurrence of such words from the Malayan as *kayu*, "tree" or "timber;" *buah*, "fruit;" *bunga*, "flower;" and *manuk*, "a bird."

The very first word of Mr. Marsden's list, "man," occurs in its Malay form of *orâng* only in two other languages of the Archipelago, the Madura and Achin, and these are known to have received more Malay than any others; while in the many languages of the Pacific it does not occur at all. On the other hand, two Sanscrit words having the same meaning represent the same idea in no less than ten languages of Mr. Marsden's own list.

* Discoveries in Central Australia by John Edward Eyre. London, 1845.

The members and other parts of an animal body, natural objects, such as water, fire, earth, a stone, sun, moon, stars, do really represent the earliest and simplest ideas, but their wide dissemination is easily enough accounted for. In fact, they are, for the most part, only synonymes, along with native terms, or, at best, words that have, in the lapse of time, displaced the latter, as they have themselves been frequently displaced by Sanscrit words.

To give a few examples: in the Malagasi, besides the Malayan word, there is one native word for "the sky," there are two for "the tongue," two for "a stone," four for "fire," five for "the eye," five for "the head," and seven for the verb "to die."

In the Bisaya of the Philippines, there are, besides the Malayan words, two native ones for "a stone," two for "earth," four for "shore" or "beach," and six for "air" or "wind."

In the dictionaries of these last languages, I observe that the Malayan word is generally placed first in order, whence I infer that it is probably the most current and acceptable, and this, I have no doubt, it owes to its more agreeable and facile pronunciation. Thus, in the Malagasi, it is not difficult to understand how the Malayan *vatu*, for a stone, should be preferred, even by a native, to *hodiboamkazo*.

That agreeableness of sound and facility of pronunciation have had a considerable share in the spread of Malayan words, I think highly probable. Thus, the Malay word *laki*, a man or male human being, is one of very easy pronunciation, and has extended to nearly every language of the Archipelago, while its correlative, *pérámpuan*, woman, a primitive of four syllables, rare in any of the Malayan languages—is found in one other language only, that of the Bima of Sumbawa, which abounds in Malayan words.

Of Sanscrit words expressing simple ideas, that have either superseded, or are more popular than native ones, the examples are numerous; as in Malay *kapala*, the head; in Javanese, *sira*, for the head; *muka*, the face, *bahu*, the shoulder, and *anguta*, a member, in several languages; *dina*, a day, in Javanese and Bali; *hasta*, the arm, in several languages; *dasa*, for the numeral *ten*, and *surya*, for

the sun, in Bali. The elephant is unquestionably a native of Sumatra and the Malay Peninsula, but the popular name for it in at least eight languages of these countries is the Sanscrit word *gaja*. There is, indeed, a native one, *biram*, in Malay, but it is obsolete, or little known.

Instead of the elementary words of language being those most widely spread, the reverse in the case. Such words are the rarest to be found in many languages, and some of the most essential have not been disseminated at all, but are found to be distinct in each separate language. In fact, the class of words most widely diffused, are in a great measure extrinsic, and the offspring of a considerable advancement in civilization; such, for example, as the names of cultivated, useful, or familiar plants; those of domesticated, useful, or familiar animals; terms connected with numeration, fishing, navigation, agriculture, the mechanical arts, the calendar, war, government, and even literature.

If, then, one language only had ever existed, we are reduced to the necessity of supposing that the people who spoke it were one race, and that they were in a social state of considerable advancement before they were dispersed, and their language broken down into the chaos of tongues at present existing, an hypothesis without the shadow of a proof.

Had such a language ever existed, we would not have failed to have the same kind of evidence of it, which the modern languages of the south of Europe afford of the existence of Latin, that is, a virtual agreement in the most familiar nouns, adjectives, pronouns, verbs, prepositions, and particles; but of this there is nothing whatever in the languages of the Archipelago, or Pacific.

There are but two languages in the Indian and Pacific Islands that have been widely spread, the Malay in the first, and the Polynesian in the last; and the evidence of a common origin in these, is as satisfactorily shown in their dialects, as that yielded by the French, Spanish, and Italian, of their common origin in Latin.

It remains to consider how the principal languages of Sumatra and Java, the Malay and Javanese, came to be so widely dissemi-

nated, as the theory which I adopt supposes them to have been, within the bounds of the Archipelago, to which I first confine my examination. I have no doubt the dissemination was effected, in the case of the languages of neighbouring tribes, by conquest, and in the more remote, by piratical expeditions, terminating in conquest and colonization; by commerce, and, perhaps, in some small degree, by religious agency.

The nearest parallels to this, with which the European reader is familiar, will be found in the piratical and commercial expeditions, conquests, and colonizations of the ancient Greeks, or the piratical expeditions, conquests, and settlements, of the Teutonic nations known as Danes, Anglo-Saxons, or Normans.

Even without the knowledge of the compass, the monsoons afford, to the nations of the Indian Archipelago, extraordinary facilities for carrying on such expeditions and such commerce, far exceeding even those of the Mediterranean; and the voyages of the Malays and Javanese, consequently, far surpass in length, if not in difficulty, those of the early Greeks and Phœnicians.

When European nations first visited the Indian Archipelago, in the beginning of the sixteenth century, they found the Malays and Javanese conducting the first stage of that commerce in the clove and nutmeg, by which these then much valued articles found their way, first into the markets of Continental India, and eventually into those of Arabia, Egypt, Greece, and Rome—that is, making trading voyages which extended from the western bounds of the Archipelago. The spices in question were found in the Roman Markets in the second century of our era; and the great probably, therefore, is, that the Javanese and Malay trade alluded to had, when Europeans first observed it, been going on for at least fourteen centuries.

The conquests and settlements of the Malays, the chief agents, have extended from the centre of Sumatra, the parent country of this people, over nearly all the coast of that island itself, over the whole Malayan Peninsula, and over nearly the whole coastof Borneo; while small settlements of them may be found as far as Timur, in one direction, and Luçon, the chief of the Philippines, in another.

The Malay language has, moreover, been, immemorially, the common medium of communication throughout all the islands. Magellan and his companions, in 1521, carried on an easy intercourse with the inhabitants of some of the small and remote islands of the Philippine group, by means of a Malay slave of the Admiral; for although the native languages were different, the chiefs and persons engaged in commerce were all found to be acquainted with the Malay.

When again they arrived at Tidor, one of the Spice Islands, they found the Malay equally current, and the vocabulary in Pigafettas' Narrative, collected there, and consisting of 352 words, is, with the exception of 20 local terms, good and current Malay, such as is spoken at the present day, Yet Tidor and the other Moluccas have, to the present time, preserved their own peculiar languages, wholly different from the Malay.*

The evidence for the agency of the Javanese, as its influence was less, is less palpable, but still sufficient. The Javanese had settled in various parts of Sumatra; and at Palembang in that island, their language still subsists entire, while through monuments, inscriptions, and names of places, it is to be traced in other parts of that island.

Similar evidence, although less complete, exists of their settlements in Borneo; and there is historical record of those made by them in the Moluccas, as well as of their predatory expeditions and commerce to the Malay Peninsula. The Javanese language, however, less euphonic than the Malay, more prolix and more difficult, was never employed as the common medium of communication; and it is not improbable that, even in their own especial settlements, it gave way to the Malay.

In its immediate neighbourhood, the influence of the Javanese has naturally been greater on the surrounding languages than that of the Malay. Thus, in the Sumánap, one of the two languages of Madura, there are, in 1000 words, 170 exclusively Javanese, and only 103 exclusively Malay. In the Bali, there are 127 Javanese,

* Prima Viaggio interno al globo terraqueo. Milano, 1800.

and 69 Malay: and in the Sunda of Java, 156 of Javanese, and only 44 of Malay.

As soon as we cross the narrow strait that divides Sumatra from Java, the proportions are reversed, although we find still a large amount of Javanese words. In 1000 words of Lampung we have 138 exclusively Malay, and 70 exclusively Javanese.

I should remark that the numerals, when they differ in Malay and Javanese, are, even in the remote languages, almost always those peculiar to the Javanese, and not to the Malay. These numerals are, 3, 7, 8, and 9; and the Malagasi, the Philippine tongues, and the Polynesian, with many intermediate languages, afford examples of this.

The different means of propagations now specified will I think, be sufficient to account for the facts, that such a language, for example, as that of the Lampungs, a people lying between and in the neighbourhood of the Malay and Javanese, should consist of nearly one half of the languages of these two nations; that the language of the remoter Bugis of Celebes, should consist of only one-fourth of them, and that in the still more remote Tagala and Bisaya of the Philippines, the proportion should drop down to *one-thirtieth* part.

I have next to consider how the Malayan words existing in the language of Madagascar may have found their way into it. The inhabitants of Madagascar are Negroes, and in race differ wholly from the Malays and Javanese. The whole number of Malayan words in the Malagasi does not exceed *one fifty-seventh* part of the language, and they are, as I have shewn, not essential to it. There is, in short, nothing in common between the two races, and nothing in common between the character of their languages.

The Indian islanders are ignorant of the existence of Madagascar and the people of Madagascar equally so of the existence of the Indian Islands. A navigation of 3000 miles of open sea lies between them, and a strong trade-wind prevails in the greater part of it. A voyage from the Indian Islands to Madagascar is possible, even in the rude state of Malayan navigation; but return would be wholly impossible. Commerce, conquests, or colonization are consequent-

ly, utterly out of the question as means of conveying any portion of the Malayan language to Madagascar.

There remains, then, but one way in which this could have taken place—the fortuitous arrival on the shores of Madagascar of tempest-driven Malayan *praus*. The south-east monsoon, which is but a continuation of the south-east trade-wind, prevails from the 10° of south lat. to the equator, its greatest force being felt in the Java Sea, and its influence embracing the western half of the Island of Sumatra.* This wind blows from April to October, and an easterly gale during this period might drive a vessel off the shores of Sumatra or Java, so as to make it impossible to regain them. In such a situation she would have no resource but putting before the wind, and making for the first land that chance might direct her to; and that first land would be Madagascar. With a fair wind and a stiff breeze, which she would be sure of, she might reach that island without difficulty in a month.

Two or three such adventures are known to have taken place since our own occupation of the Mauritius, and, consequently, more frequent intercourse with Madagascar. Earl Grey, at my request, has most obligingly written to the Mauritius for the particulars of these strange adventures; and I am only sorry that the replies have not arrived in time to lay the information before the Association.

The accident of *praus* being tempest-driven from the shores of the Malay Islands, is probably one of not unfrequent occurrence, although few of them may reach Madagascar. Shortly after the restoration of Java, in 1816, the late Captain Robinson, of the Indian Navy, picked up a small fishing-boat, having on board two Malay men and a woman, 800 miles from the nearest Malay shore; and being a gentleman well acquainted with the Malays and their language, he could have made no mistake about nationality,

The occasional arrival in Madagascar of a shipwrecked *prau*, might not, indeed, be sufficient to account for even the small portion of Malayan found in the Malagasi; but it is offering no violence

* See the Directory of my greatly respected friend, the late Capt, Horsburgh.

to the manners or history of the Malay people, to imagine the probability of a piratical fleet, or a fleet carrying one of those migrations, of which there are examples on record, being tempest-driven, like a single *prau*. Such a fleet, well-equipped, well-stocked, and well-manned, would not only be fitter for the long and perilous voyage, but reach Madagascar in a better condition than a fishing or trading boat. It may seem, then, not an improbable supposition, that it was through one or more fortuitous adventures of this description, that the language of Madagascar received its influx of Malayan.

Respecting the probable era of such adventures, we have just one faint ray of light. With the Malayan, there came in a few words of Sanscrit, such as are popular in the Malay and Javanese. From this it may be fair to infer, that the chance migrations I have supposed, whether they had before taken place earlier or not, may have taken place, at all events, as early as the epoch of the connection of the Hindoos with the Indian Archipelago,—a connection, the commencement of which cannot, I think, be placed later than the birth of Christ.

I have, finally, to attempt an explanation of the manner in which Malayan words may have found their way into the languages of the Pacific. The proportion of Malayan words in the Polynesian, judging by the New Zealand dialect, is more than 20 in 1000, while in that of the Sandwich Islands it does not exceed 17. Except in these few words, there is nothing in common between those who speak the Polynesian. Their races are different, and their languages distinct.

Conquest and settlement by the Malays, Javanese, or other tribes of the Archipelago, had probably, therefore, nothing to do with the dissemination of the Malayan in the languages of the Pacific. I have no doubt, then, that, as in the case of the language of Madagascar, it was the work of tempest driven *praus* or fleets, and gradually, and step by step, from island to island, transmitted in the course of ages, to the Sandwich Islands north of the equator, to New Zealand south of it, and as far as Easter Island.

The trade-winds are the seeming obstacle to this communication: but when the question is duly examined, they do not prove to be so. The south-west monsoon, to the north of the equator, extends to the Marianne Islands, and the 145° of east longitude; and the north-west monsoon to the south of the equator, as far east as New Guinea; while westerly winds are frequently experienced in the Pacific far to the west of this island. This is the statement of the accurate Captain Horsburgh.*

La Perouse goes farther, and observes, that westerly winds are, at least, as frequent as east in the Pacific in a zone of 7° on each side of the equator, and that the winds are so variable, that it is little more difficult to make a voyage to the eastward than to the westward.† The testimony of Captain Fitzroy is to the same effect.‡

But it is further ascertained, that the monsoon "(the western) is occasionally experienced through all the islands of Eastern Polynesia."§ Captain Beechy, in his instructive narrative, informs us that he picked up at sea a tempest-driven canoe, belonging to Chain Island, three hundred miles east of Tahiti, and subject to it. She had been on a voyage to the latter, and by two successive gales from the westward, was driven 600 miles out of her course, to Barrow Island, in about the 20th degree of south latitude. When rescued, she had on board twenty-eight men, fifteen women, and ten children; in fact, the nucleus of a little colony.

Captain Wilson found, when wrecked on the Pelew Islands, in the 8° of north latitude, and the 135° of east longitude, three Malay mariners; and, having among his own crew a Malay interpreter, he was able to communicate with the natives through these Malays, who had acquired the Pelew language. The account which they gave of themselves was, that in a voyage from Batavia to Ternate, one of the Moluccas, touching at Menado in Celebes, they were driven by a storm on the Pelew Islands. One of them, however, who

* Horsburgh's East India Directory.

† La Perouse, vol. ii.

‡ Narrative of the Surveying Voyages of the Adventure and Beagle, by Captain Fitzroy, R.N.

§ Voyage to the Pacific in 1825, &c. &c., by Captain Beechy, R.N. London. 1831.

accompanied Captain Wilson to England, acknowledged that he and his companions were part of the crew of one of three piratical *praus.*

Casual wrecks like this might easily have carried the Malayan language to the most westerly of the islands of the Pacific, within the tropics; while adventures, like that of the Chain Island canoe, would in the lapse of ages, convey it, step by step, to Easter Island and the Sandwich group.

This explanation would sufficiently account for the dissemination of the Malayan language over the tropical islands of the Pacific; but, it must be admitted that there are greater difficulties in respect to the large islands of New Zealand, the nearest portion of which is 35° from the equator and, consequently, within the region of variable winds and tempests.

The same difficulty, however, it should be observed, exists in attempting to account for the fact of the New Zealand islands being peopled, throughout, by the Polynesian race, speaking the Polynesian language. By some means or other, practicable to a rude people, an intercourse, we may be quite sure, took place between these islands and the intertropical ones inhabited by the same race of men, speaking the same language—since men are no more born with language than with mathematics—are born, in a word, only with a capacity to acquire both, equally branches of acquired knowledge. For New Zealand, then, notwithstanding the difficulties of the voyage, whether from the Malay Archipelago, or between it and the intertropical islands of the Pacific, tempest-driven praus, or fleets of praus, are our only resource for a rational explanation.

A brief examination of the cultivated plants and domesticated animals of the Polynesian Islands, on their first discovery by Europeans, may, perhaps, be thought to throw some light on the mode in which their languages received an infusion of Malayan.

The following were the plants,—the cocoa-nut, the bread-fruit, the yam, the batata, the taro, the sugar-cane, the orange, the banana, the bamboo, and the paper-mulberry. Every one of these is a native of the Indian Archipelago; but if the Malayan nations brought

them, they did not bring the names with two trifling or partial exceptions. The cocoa-nut is known by a Malayan name in the Polynesian dialect of the Sandwich Islands, but not in the Marquesas. It has the same Malayan name also in the Negro languages of New Caledonia and Tanna, but not in the Malicolo. In the New Caledonia alone, I find the Malayan name for a yam written *ufi*, for *ubi*. In the Tanna and Malicolo, these different ones.

Rice, with all the numerous pulses, and esculent vegetables known in the Indian Archipelago, were not found in the islands of the Pacific; and with the exception of the banana and orange, the numerous fruits of that region were wanting.

The domesticated animals found in the South Sea Islands were only the hog, the dog, and the common fowl. In none of the languages, either of the brown, or negro races, are the name of these animals, Malay, Javanese, or of any other language of the Archipelago, except that of the Marianne Islands, in which is found the Javanese word *manuhe* " a bird" or " fowl," the name for the common poultry in the Philippine languages.

Among the most frequent of the domesticated animals of the Malayan Archipelago are the goat, the cat, and the duck, and had a communication existed between it and the islands of the Pacific, they must, from their hardiness, have been introduced; but they are all three wanting.

The absence of Malayan names for both plants and animals, supposing the plants and animals to have been derived from the Indian Archipelago, would be the more remarkable from the frequency of the same name, for these objects, in the different Malayan languages themselves. Thus, for the domestic dog, the Javanese name is found in ten other languages, and the Malay name for the domestic hog in forty others. The name for the yam and for the sugar-cane is almost as often repeated from one extremity of the Archipelago to the other as that of the hog.

From the absence of Malayan names for plants and animals, and the absence of hardy plants and animals that might, in a transit of ordinary facility, have been introduced from the Malayan Archipe-

lago into the islands of the Pacific, I must infer, that neither were introduced by the means through which the Malayan language was communicated to those of the Pacific. I conclude, on the same ground, that the voyages were fortuitous and precarious, such as I have fancied them. Had the plants or seeds of plants, and the animals, been even on board the storm-driven *praus*, it is certain they must have been devoured by the famishing crews as food.

Although all the domesticated animals and cultivated plants of the Islands of the South Sea, are common to the Malay Islands, and all, I believe, indigenous in the latter, I think it, on the whole, more probable that they were indigenous also in the former, than that they were introduced from any quarter, and consequently that the culture of the one, and the domestication of the other, were native arts.

The hog and dog of the South Sea Islands are very peculiar varieties. The hog is said to resemble the Chinese breed, having a short body, short legs, a belly hanging almost to the ground, and erect ears. The dogs have "a prodigious large head, remarkably little eyes, pricked ears, long hair, and a short bushy tail." This is neither the hog nor dog of the Malayan islands in the wild or domesticated condition.

The domesticated animals are very unequally distributed over the South Sea Islands. The hog, the dog, and common fowl are all three found only in the Society and Sandwich groups. New Zealand has the dog only. The Marquesas, the Friendly Islands, and New Hebrides, want the dog. Easter Island and New Caledonia have only the common fowl. This last alone is general.*

This irregularity of distribution is remarkable, and would seem to point at the precarious nature of the communication through which so many of the islands have been peopled by the same nation, for had the intercourse been one of ordinary facility, it cannot be doubted, but that the emigrants would have carried along with them their usual demesticated animals, in the entireness of their number.

The animals of the islands of the Pacific, now existing only in

* Forster's Observations on Cook's Voyage.

the domesticated state, may, then, once have existed in some of them, in the wild one, and, as in other countries, been exterminated in the progress of population. The hog and common fowl in the wild state are certainly found in some of the Malay islands much smaller than Tahiti or Owaii, from which, at the same time, the large quadrupeds, the ox, the buffalo, the rhinoceros, and the tiger are excluded.

Still, it must be admitted that this branch of the subject is full of difficulties. The Sandwich Islands, to the north of the equator, had the hog, the dog, and common fowl, while the Marianne group, also to the north of the line, and by 50° of longitude nearer to the Archipelago, had neither the hog nor dog, and probably not even the common fowl. On the other hand, the common fowl, in the wild, but not the domesticated state, was found in the Pelew Islands, on the same side of the equator.*

The objections to the hypothesis which some have maintained that the hog may have been introduced by European shipping, in comparatively modern times, are,—that there is no record of any such event down to the time of Cook—that the varieties of the animals in question are different from any known European varieties—that they are the same throughout—that the names of the animals are neither European, nor have reference to an European or other foreign origin as is the case with the animals since introduced by Europeans; but that, on the contrary, they are native, and the same throughout, wherever the Polynesian language is spoken, New Zealand alone excepted, in so far as concerns one animal, the dog.

The Marianne Islands, when discovered, were found destitute of nearly all the domesticated animals. The Spaniards introduced the ox, the horse, the ass, deer, goats, the dog, the hog, and the cat, some of which have since returned to a state of nature. Here we have evidence of foreign, and even of European introduction. The cat is called *keto* or *gheto*, evidently a corruption of the Castilian *gato;* and the dog is called by a compound epithet, meaning "for-

* Freycinet, voyage autour du Monde; Wilson's Account of the Pelew Islands.

eign animals."* There is nothing like such evidence, historical or philological, in the languages of the Pacific.

I shall conclude with a brief recapitulation of the results at which I have arrived in this essay.

The races of men referred to in the inquiry do not consist, as commonly supposed, of one brown-complexioned, and one negro race, but of several of both.

The inhabitants of Madagascar are Africans, and wholly distinct from all the inhabitants of the Malay Archipelago or Pacific.

There are many languages essentially distinct from each other, both of the brown-complexioned and negro races, and not one only of each of these two, as generally supposed.

Except in the case of the Malay in the Archipelago, and the Polynesian in the Pacific, there are no wide-spread languages or dialects.

As far as our scanty knowledge of the Negro languages will enable us to judge, the only clear distinction between them and those of the brown-complexioned consists in the first containing always more consonants in proportion to vowels, and more harsh combinations of consonants than the latter.

It is chiefly the Malay and Javanese, the languages of the two most powerful, civilized, and enterprizing nations of the Archipelago, which is found in other tongues, from Madagascar to Easter Island, and from Formosa to New Zealand.

The evidence for this exists in the words themselves, and their being pure and numerous as we are near Sumatra and Java, the original countries of the Malay and Javanese nations, and corrupt and unfrequent as we recede from them, until the barrier becoming insuperable, they disappear altogether.

The superior civilization of the people of the countries of the Asiatic continent has excluded Malayan and Javanese from their language—a grovelling condition of society has excluded them from those of the tribes of Australia, and insuperable physical obstacles from those of America.

* Freycinet, voyage autour du monde; Wilson's Account of the Pelew Islands.

Within the Malayan Archipelago the Malay and Javanese languages have been communicated to others by conquest, settlement, or colonization, and commerce; while to Madagascar, and the islands of the Pacific, they have been communicated by the accidents of tempest-driven *praus* or fleets of *praus*.

The insular character of the whole region over which a Malayan language has been disseminated, and the periodical winds prevailing within it, which on a superficial view, appear obstacles, are, in truth, the true causes of the dissemination; for, had the region in question been a continent, stretching north and south like America, or lain within the latitudes of variable wind and storms, no such dispersion of one language could have taken place.

Such is the most rational explanation I can render of a fact in the history of our race, mysterious without explanation, and wonderful enough even with it.

CUSTOMS COMMON TO THE HILL TRIBES BORDERING ON ASSAM AND THOSE OF THE INDIAN ARCHIPELAGO.

At the present day three hypotheses are entertained respecting the origin of the people of the Indian Archipelago. One is more properly a negation of all hypotheses, since it considers each tribe as having come into being in the country where it is found, like the indigenous plants and animals with which it is surrounded. This is Mr. Crawfurd's view. However unsatisfactory we may find it, we must remember that we have no right to ascribe a foreign derivation to any of these tribes until we have accumulated facts sufficient to counterbalance the fact which lies at the bottom of this opinion. At the same time it should be borne in mind that ethnography does not, from its nature, require nor admit of more evidence than we are in the habit of receiving as sufficient in analogous enquiries. A decided preponderance of probabilities in favour of one of several possible solutions of a question is all that we should in general hope for as the result of our researches. Another hypothesis refers the peopling of the Polynesian islands and the Archipelago to America. This view has been ably stated and maintained by Mr. Ellis. The third hypothesis derives the inhabitants of the Archipelago from the adjacent continent. This is so obviously the most natural one that it probably occurred to the first person to whom the question of the origin of the tribes of the Archipelago presented itself. The proximity of the continent, with the densely peopled plains of its great rivers flowing southward, and its mountain ranges and peninsulas thrown out to the borders of the Archipelago, all tending to impress a southerly direction on migrations, would of itself suggest the probability of a portion of its population gradually oozing out into the Archipelago. The volcanic band which forms the external boundary of the Archipelago almost touches one of the mountain chains of the continent, so that from its central region, where all the chains and rivers rise, to the remotest south and almost to the extreme east of the Archipelago, there are none but inconsiderable

breaks in the land. The Johore Archipelago offers a series of stepping stones to Sumatra.* The north-west coast of Borneo and the Philippine group present extensive shores, opposed to the seaward extremities of the continental ranges and rivers, which could hardly fail occasionally to receive visitants from the mainland from the very earliest times at which tribes existed there possessed of boats. *A priori* therefore nothing would seem to be more improbable and extravagant than the assumption that the Archipelago derived its population from America rather than from the shores of the neighbouring continent. The next step in the chain of observation would be the remark that the personal characteristics of the principal races of the Archipelago allied them, at the present day, to the races of Eastern Asia. When their agreement with the Indo-Chinese people in particular was further found to extend to many peculiar customs and practises, it would go far to convert surmise into conviction. Those who entertained this conviction assumed that the human race was one species, and that its original seat was in Asia.

A few years ago, on reviewing all the evidence within our reach that had been brought to bear on this subject, we were impressed with a belief that the Archipelago had been first peopled from eastern Asia at an extremely remote period, but we saw, at the same time, that, as yet, the belief rested on a combination of strong probabilities and not on complete demonstration. The evidence available, however, so far from being exhausted appeared to have been hardly opened. It was evidently to be sought along the band of mountain chains which connect the Archipelago with central Asia. But of the ethnography of this band, as of the Archipelago itself, our knowledge was nearly confined to the more civilized races, while even of these it was imperfect. Considerable observation and speculation had been bestowed on the Javanese, Malays, Siamese, Cochin Chinese, and Burmese, but the more barbarous races and tribes were little known and less regarded. Of many we knew but the

* This was the route by which the Malays of Sumatra passed over to the Peninsula.

names, and as the great bulk of the region, and particularly the mountainous part, was entirely unexplored, the probability was that numerous tribes were unknown even by name. Now it was precisely amongst the secluded mountain tribes that most light was to be expected on the pristine condition of the inhabitants of the region. It was by following these tribes along the great ranges and their outskirts, and allowing at every step for the influence which the bordering civilized races might have exercised, that traces of a community of origin were to be sought; and it was indirectly, by enabling us to make this allowance, that a knowledge of the condition, in the present and in past times, of the civilized races seemed to be chiefly available in such an enquiry. To hope for satisfactory evidence by a direct comparison of these races seemed to be unreasonable, because the races that had been longest withdrawn from seclusion, exposed to the contact and transforming influences of foreign nations, or even simply modified by indigenous civilization, were the very races amongst whom the common inheritance of aboriginal peculiarities was likely to have dwindled to the smallest remnant. To dismiss the ruder tribes in a survey of the Archipelago as unworthy of consideration appeared, therefore, not only to be placing ourselves, the civilized observers, in an entirely false position with respect to what must everywhere be the greatest natural phenomena of a country—the human tribes which inhabit it,—but to be turning our backs on the very facts that must contain the solution of some of the highest and most interesting enquiries with which modern civilization occupies itself.

With such views the investigation of the languages and customs of the mountain and hill tribes of the Archipelago and the region between it and Thibet assumed a high and settled importance, which led us to hail with satisfaction every addition to our most scanty knowledge of them. The labours of several of the members of the Asiatic Society of Calcutta promised in time to place us in possession of a body of facts relating to the tribes bordering Bengal and the more easterly people of Bengal itself whose ethnological connection with the Hindu-Chinese nations we formerly indicated. It has been

our intention to avoid reviewing the results of these and other recent contributions to the ethnography of Eastern Asia and the Archipelago until a considerable mass of new facts shall have been accumulated in the pages of the Journal. In the meantime we think we shall perform an acceptable service to many of our readers whose isolated position deprives them of the means of keeping themselves informed of the accessions that are being made to this subject through other channels, if we from time to time notice the most interesting of these.

Our prefatory remarks will have prepared our readers for the importance which we attach to the first work we proceed to notice "A sketch of Assam with some account of the hill tribes." The very brief details respecting the latter are so rich in the promise of results for the ethnography of the Indian Archipelago that we ardently hope the author will ere long furnish that more full and minute description which is essential for purposes of comparison, and which he is evidently well qualified to write. Brief as his present contribution is, it enables us to trace some of the most striking customs of the aborigines of the Archipelago from New Guinea through Borneo up to a more northerly point than we could previously do.

Amongst these tribes we find some of the most remarkable habits of the Dayak repeated. Amongst the Nagas as amongst the Dayak and Báttá the death of an enemy is not the satisfaction of revenge but merely the means towards it. The end is the possession of the dead body. The Dayak carefully preserves and makes a display and boast of the heads, but the triumph of having them in his possession appears to satisfy him, or rather vanity supplants revenge and he cherishes and values them as trophies. The Báttá eats the body and preserves the brain. In the Nagas also the gratification of revenge predominates. When they resolve to attack a village they surround it stealthily at night and lie in wait till the first cock crow, when they rush into it with great shouting and cut up every living thing even to the cattle and fowls. They carry back to their home the heads, hands and feet of their enemies, parade them from

house to house, and drag them about dancing, singing, drinking and boasting. Instead of merely hanging the heads to their persons like the Dayák warrior on similar occasions they mangle and insult them, cursing them, throwing rice and liquor on them, and saying "call your father, mother and relations to come here and join you in eating rice and drinking spirits, when we will kill them with the same sword." When this feast of victory has continued for three or four days, the heads are suspended on Nahor trees in the village of the Khonbao or president of the clan, the other villages not being entitled to the honor. The Nagas who have taken a part in the work of massacre are then tatooed. Fresh marks on particular parts are impressed according to the numbers of persons each has killed. When they have recovered from the effects of the operation a great feast is given, and the heads are taken down from the trees and strewed on a platform for display. As with the Dayák every death must be revenged by taking the head of one of the murderers tribe, even though two or three generations may sometimes elapse before the retaliation can be effected.

We already knew that the practise of head hunting prevails amongst the Kookies to the north east of Chittagong, where it preserves the very form in which we find it amongst the Dayák.* Its existence is now ascertained to the confines of Thibet. The practice of tatooing may be traced from the same latitude through Burmah

* The Kookies or Lunctas are a tribe who inhabit the mountains to the N. E. of Chittagong. They make their houses as close to each other as possible and large enough to accommodate four or five families. They are on stages of bamboos six feet above the ground. When they attack another village their mode of proceeding is similar to that of the Nagas above described, whatever their superiority may be. "They seldom spare either age or sex but occasionally preserve and adopt children." "The heads of the slain they carry in great triumph to their *paroh* (fortified village) when the warriors are met on their arrival by men, women and children with much rejoicing." In negociating marriages the number of heads of enemies and wild animals which the young man can produce in proof of his prowess is mentioned amongst his recommendations. "Each warrior has his own particular pile of heads and according to the number it consists of, his character as an hunter and warrior is established in the tribe." Bengalee woodcutters on the borders of the jungles in the Rumganeeah and Aurungabad districts are frequently surprised by Kookies who invariably cut off and carry away their heads.

Mr. Macrae's account of the Kookies, (1798.) Asiatic Researches vol. vii p. 183.

and Laos to Borneo and Sumatra, where it prevails amongst the Báttá and the inhabitants of the Poggy islands.

Another of the most striking peculiarities of the aborigines of Borneo and New Guinea is observed amongst the Mishmees. Several villages consist each of a single house divided into twenty or more rooms opening into a common passage. These houses contain from 80 to 160 persons (p. 124.) The Singhphoos have also large houses, sometimes 100 feet long, divided into compartments for different families (p. 85.) It does not appear that the Nagas have these village-houses, but amongst them the Pangah or bachelors hall of the Dayák village is found under the name of Mooring. In this all the boys of the age of nine or ten years and upwards reside apart. The Nagas have, in addition, a girls house, which has not been observed amongst any of the Dayák tribes.

Religion.—"The Mishmees invoke an unknown spirit supposed to reside in the inaccessible mountains or dense forests; and on being afflicted by famine, sickness, or other misfortunes, they invariably sacrifice fowls and pigs." In this they resemble the people of the Poggy islands. The Nagas are great observers of omens (p. 155.) Singphoos killed in battle are deified, and sacrifices are offered to them.* Buffaloes, hogs and cocks are sacrificed to Ning deota or Ning schees, the God of the elements, in times of calamity. The sculls of the sacrificial buffaloes are preserved hung up in their houses.

Funeral Ceremonies of the Nagas.—"The Nagas consider sudden death as particularly unfortunate; even if a person dies after one or two months' sickness, the period is still deemed too short to be lucky; and his corpse is instantly removed and placed in the jungles on a platform four or five feet high, where it is left to decay. For three or four days after a death, the relatives do not leave the village; neither do other villagers resort to the village in which death has occurred during the same period. If a person dies who has been afflicted with a long illness, a platform is raised within his

* The Tagalas and some other tribes of Luçon worship the spirits of their ancestors.

house, and the corpse being folded in clothes is placed thereon. By night and day the corpse is watched with great care, and as soon as it begins to decompose, large quantities of spirituous liquor are thrown over it; and whatever the deceased was in the habit of eating and drinking in his lifetime (such as rice, vegetables, and liquor) is placed once a month on the ground before the body. The virtues of the deceased are frequently rehearsed; the heirs and relatives throw themselves on the earth, and make great lamentations for many months after the death has occurred. At the expiration of the period of the mourning, a great feast of liquor, rice, buffaloes' and cow's flesh is prepared by the suvivors; and an immense number of people, armed with their swords and spears and dressed in the most fantastical garb, as if preparing for a war expedition, are assembled to partake of it. They commence the festival by repeating the name of the deceased, singing many kinds of songs, dancing and cursing the deity or spirit in these words: "If today we could see you, we would with these swords and spears kill you. Yes, we would eat your flesh! yes, we would drink your blood! yes, we would burn your bones in the fire! you have slain our relatives. Where have you fled to? why did you kill our friend? show yourself now, and we shall see what your strength is. Come quickly,—today, and we shall see you with our eyes, and with our swords cut you in pieces, and eat you raw. Let us see how sharp your sword is, and with it we will kill you. Look at our spears, see how sharp they are: with them we will spear you. Whither now art thou fled? than thou, spirit, who destroyest our friends in our presence, we have no greater enemy. Where are you now?—whether hast thou fled?

"With these and similar speeches and songs, they clash their swords and weapons together, dance, and eat and drink throughout the night. On the following day the corpse is folded up in a cloth and placed on a new platform four or five feet high; and the whole of his weapons, swords, spears, panjees, chooga (hollow bamboo point, for holding water,) rice-dish, in fact everything used by the deceased in his lifetime, is now arranged round his bier, which is

held sacred; no one would dare to touch a single thing thus consecrated. after this ceremony is concluded, the whole of the party disperse to their respective homes.

"On the death of the Namsungea Khonbao, who, it is said, was one hundred and twenty years of age, his corpse was removed in December 1843, and according to an ancient custom, a tusk elephant was purchased from the Muttuck Bur Goham, and killed with three hundred buffaloes and pigs; when the Nagas enjoyed a magnificent feast. The usual practice of reviling the deity, while singing and dancing, was kept up with uncommon fervor, and the bacchanalian scene has perhaps seldom been exceeded. The heads of the slaughtered animals were suspended round the platform within a large enclosure, and the corpse was strewed over with an abundant supply of all kinds of forest flowers."

Food.—The Nagas eat cows, dogs, cats, vermin and even reptiles, and are very fond of intoxicating liquors.

Crimes.—Theft is held in great abhorrence by the Nagas.

Among minor habits resembling those of the Archipelagic tribes are that of the large perforations of the ear, one inch in diameter amongst the Mishmees and Abors (p. 111, 116), the brass rings from the wrist to the elbow, the cane rings on the calf of the leg to the ankle of the Abors (p. 111), the practice of pulling out the hair of the beard common to all the hill tribes of Assam (p. 111), the addiction of the chiefs of the Khamtees, like those of some Dayák tribes, to ingenious mechanical arts (p. 58) and the abandonment by the Abors of forest ground that has been cleared, after cropping it for three years.

Maxima and Minima of atmospherical temperature at Singapore.

February, 1848.

	Min.	Max.		Min.	Max.
1	73	86	16	73	82
2		87½	17	71	87¼
3	72	89½	18	71	85¼
4	71	88½	19	72¾	85
5	71	87	20	72	86
6	71	88	21	71	86
7	71	86¼	22	73	89
8	72	82	23	74	86
9	72	85	24	73	88
10		84	25		88
11	71	85	26	69	88
12	71	79½	27	71	88½
13	71	86	28	73	90
14	70	86	29	70½	86
15	72	85			

Mean { Min. 71. 62
Max. 86. 2

J. R. L.

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AND
EASTERN ASIA.

AN ACCOUNT OF THE WILD TRIBES INHABITING THE MALAYAN PENINSULA, SUMATRA AND A FEW NEIGHBOURING ISLANDS.*

By the Revd. P. Favre, Apostolic Missionary, Malacca.

These wild tribes are divided into three principal classes, which are subdivided into many others. The first of these divisions includes the Battas, who are said to inhabit the interior of Sumatra and a few neighbouring islands. The second is that of the Semangs, who are found in the forests of Kedah, Tringanu, Perak and Salangor. Under the third head are comprised many tribes, known under the ordinary term of Jakuns, which inhabit the south part of the peninsula from about Salangor on the west coast and Kemaman on the east, and extending nearly as far as Singapore.

All these various wild tribes are ordinarily classed under the general and expressive appellation of Orang Binua, which signifies, men of the soil; this will be the expression I will use when speaking of these tribes generally and without intending to refer to any one in particular.

* In the title page of the MS. the author adds "First part of a work composed at the request of his honor Lieut. Colonel Butterworth, C.B., Governor of Prince of Wales island, Singapore and Malacca." This valuable paper has been presented to us by Colonel Butterworth, whose constant interest in the Journal and most effective support demand a renewed expression of our warmest thanks.

ORIGIN OF THE BINUAS.

Several opinions have arisen respecting the origin of the wild tribes, or Orang Binuas; but these opinions are based only upon conjecture, more or less probable; and until now no certainty, and even nothing really satisfactory, has been discovered on the subject. It is more than probable that the residence of the Missionaries, who are now about establishing themselves in the Peninsula in order both to civilize and to christianize these wild tribes, will prove a source of some interesting discoveries in different branches of learning, and chiefly in whatever refers to the people to whom we now direct our attention. In the mean time I will for the solution of the several questions which can be raised on the origin of the Binuas, direct attention to several facts, and while I will recapitulate the various opinions which have heretofore been offered upon the subject, will finally say what appears to me most probable both from these sources of information and from what I obtained from the Binuas themselves in the numerous sojourns I made amongst them.*

The first question which naturally presents itself to our mind on the subject is this—are the Binuas to be considered as the aboriginal inhabitants of the land where they are found; chiefly in the Malayan peninsula? Such a question will remain a problem for some time yet, and perhaps for ever: nevertheless I must say that many facts seem to prove much that is in favour of an answer in the affirmative.

Among the Binuas whom I have interrogated on the matter, many answered that the Malays were descendants in great part from them, who were, without any doubt, the first inhabitants of the land.

Many Malays are of the same opinion, and upon it is based the appellation of Orang Binuas, men of the soil, by which the Malays designate the wild tribes.

A fact which is related in the Malayan traditions and history, and quoted by Lieut. Newbold (vol. 11. p. 77.) proves much in favour of that opinion.

* The order I follow here under the title *Origin*, will be also followed under the other titles.

It is said, "after Sri Iscander Shah fled from Singapore to Malacca in the seventh century of the Hejira, that is in the thirteenth century of the christian era, a Menangkabau chief, named Tu Puttair came over to Malacca, attended by a numerous retinue. He ascended the river to Naning where he found no other inhabitants than the Jakuns, and settled at Taba and took to wife one of the Jakun damsels; an example speedily followed by his vassels." The tradition says also that this colony gradually increased and spread itself over Sungei Ujong, Rumbau, Johole, and other places then inhabited chiefly by aborigines, or Jakuns. From whence we may infer, that if the aborigines or Binuas (Jakuns) were already spread over so many places, they must have inhabited the Peninsula from a remote period of time, an inference which is strengthened when we consider that the manners and customs of this people must be a great obstacle to a swift increase in the population, and again that the Malays at that time, (in the thirteenth century) had but a short time inhabited the Peninsula, since we are informed by the *Sejara Malayu*, that Singapore, so celebrated in Malayan history, as having been the first place of settlement of the early Malay emigrants from Sumatra, and the origin of the empire of Malacca, received her first colonists only in the twelfth century, when Sang Nila Utama, supposed by Mohammedan historians to have been a descendant of Alexander the Great, settled on the island with a colony of Malays originally from Sumatra, and founded the city of Singapore. A. D. 1160, that is about one hundred years before the arrival of the Tu Puttair at Naning; where the Jakuns, who were then already numerous, as well as in the other places before mentioned, seemed to announce colonists of more than one century.

Besides, the Binuas are not Mahommedan; but had they come to establish themselves in the peninsula subsequently to the Malays, we should expect to find them Mahommedan; for it is scarcely credible that at the time when the disciples of Mahomed were so ardently waging war everywhere, forcing every nation to embrace the Koran, it would have been permitted to the Binuas, and only to the Binuas, who would have been few and feeble ,to enjoy the benefit of

a free conscience; and that, when we are supposing the Malays already established there, and consequently having all power to make of them faithful disciples to their beloved prophet.

It is also stated by the Binuas, and admitted by the Malays, that before the Malay Peninsula had the name of Malacca, it was inhabited by the Binuas. In course of time, the early Arab trading vessels brought over priests from Arabia, who made a number of converts to Islam: those of the Binuas that declined to abjure the customs of their forefathers, in consequence of the persecutions to which they were exposed, fled to the fastnesses of the interior, where they have since continued in a savage state.

I am therefore inclined to be of the opinion which Lieut. Newbold appears to embrace, and I am induced the more readily to believe that the Binuas, and chiefly the Battas of Sumatra and the Semangs of the north of the Peninsula are the savage people whom Herodotus has spoken of, as inhabitants of the eastern countries of India producing gold; and I dare say with the same author, that it is scarcely possible that the father of history intended to speak of any other Indian people; for he would have spoken of such clearly and fluently; since all the other parts of India to the Archipelago were very well known to that historian, whilst he on the contrary speaks of the tribes he describes, only in rather an obscure style, and as "having received an account of them from some adventurous traders who having sailed from the shores of the Red Sea or the banks of the Euphrates, coasting the shore of India to the Archipelago: and who returned to their native lands laden with the gold dust, ivory and spices of the east. The Malayan Peninsula, the Golden-chersonese of Ptolomy, and Sumatra so rich in gold, camphor, pepper and ivory, would be the first countries producing these tempting articles of commerce that fell in their way and the existence of people in whose country they were to be found, could not remain long a secret to such inquisitive navigators."

Besides, the account given by Herodotus of the savages he describes, seems to agree with the name and customs of some of the wild tribes who are now the subject of our consideration. He says

that amongst them, some are called Padda a term which can be easily converted into Batta; and he mentions their practice of killing and eating their old relatives, which agrees perfectly with the account given by Sir S. Raffles of the Battas; " I was informed, says he, in his memoirs, that formerly it was usual for the people to eat their parents who were too old for work. The old people selected the horizontal branch of a tree, and quietly suspended themselves by their hands, while their children and neighbours forming a circle danced round them, crying out *when the fruit is ripe, then it will fall.* This practice took place during the season of limes, when salt and pepper were plenty, and as soon as the victims became fatigued, and could hold on no longer, they fell down, when all hands cut them up and made a hearty meal of them"—Memoirs, p. 427.

I would not found any objection to the admission of this opinion, from the observation that a few centuries after Herodotus the Indian Archipelago was entirely unknown, as in the time of Strabo, Hipparchus and Eratosthenes, who were living in the years 20,190 and 220 before the christian era ; because it is certain that on account of the extensive practice af the Hebrews and Tyrians in the art of navigating, the knowledge of navigation and geography was much more extensive in the time of Herodotus and anteriorly, than in the time of Strabo, Hipparchus and Eratosthenes, when the art of navigation was less practised, and had lost much of its activity ; so the Peninsula and the Archipelago might be known in the time of Herodotus and forgotten in the following centuries. We see in history a similar example in the Cape of Good Hope, which was known a long time before Herodotus, since he himself relates that 128 years before his birth, that is in the year 610 before the christian era, the Hebrews and the Tyrians rounded Africa by order of the king of Egypt, and that they doubled the Cape of Good Hope, a road which was yet known to Eratosthenes, and after that was entirely forgotten, during near 2,000 years ; since the maps drawn according to Hyyarchus, Strabo and Ptolomy show a land embracing the Erythrean sea, or the sea of India, meeting on one side with Africa at the Prasum Promontory, and on the other with Eastern Asia at Catigara. It was only in 1497 A.

D. that Vasco de Gama, a Portuguese, rediscovered the road from Europe to India round the cape.

According to the preceding considerations it may be supposed, without any presumption, that the Binuas are the aborigines of the land they inhabit, chiefly in the Peninsula, (I will except a small number of them who are living near Malacca whom I will speak of hereafter). But from what branch of the great family of mankind do the Binuas spring? This is a point extremely obscure; History says nothing on the subject, and tradition is almost silent.

Lieut. Newbold, from the several opportunities he had of seeing the Binuas, observed that their general physical appearance, their lineaments, their nomadic habits and a few similarities in customs, point to a Tartar extraction.

Another opinion, adverted to by Sir S. Raffles, says that Java was originally peopled by emigrants coming in vessels from the Red Sea; from whence it is infered that these ancient Egyptians might have been the ancestors of the people at present called Binuas. *

I will not now attempt to offer any decided opinion on the subject as respects the Battas of Sumatra, or the Semangs of Kedah Tringanu, Perak, and Salangor, as I have never seen any of these tribes and have received but very little information about them. I will however here state what I have observed respecting the Jakuns, the third class of Binuas I have mentioned, as inhabiting the south part of the Peninsula. Under that name are comprised all the various tribes, known under the terms of Orang Utan, Orang Bukit, Orang Sungie, Orang Laut, Rayet, Sakkye, Halas, Balandas, Besisik, Akkye, etc, different names which denote not several kinds of men, but which only point out the places where they are found, or their way of living.

Although these various tribes are similar in many points, as in manners, customs, in their way of living, etc: in some other respects they seem to announce a different origin; and possibly I should not be mistaken were I to divide them into three subdivisions. Those

* Sir S. Raffles' opinion was that the people of the Archipelago and Peninsula were of a Tartar stock. Hist. of Java, vol. i. p. 62, 3,(2d ed.) ED.

who are living near to Malacca: those who are found in the Johore territory; and those who are spread over Johore, Rumbow, Sungie Ujong, Jellabu and the neighbouring places.

Under the first head I will comprise those I visited, near Reim, at Ayer Baro, Gassing, Kommendar, Bukit Singhi,; on the river of Muar, near Pankalang kota, at Poghalay, Sagil, Lemon, Segamon, a few families in the small river of Pago and several other scattered individuals.

Amongst these tribes, who in number amount altogether to about three hundred persons only, I found a tradition which would make them to be descendants of Portuguese, and to which the following relates.

A few months after my arrival here, an inhabitant of Malacca, in order to satisfy my curiosity, brought to me two of these Jakuns, as a specimen of the race; it was not without considerable difficulty that he could induce these children of nature to accompany him to the civilised town, being much more delighted with the rude aspect of their thick jungle, than with the extensive view of our open places; but after several promises they took their way to Malacca; and recollecting a tradition they received, as they say, from their forefathers they asked that when arrived at the town, they should be allowed to look at the likeness of their ancestors, which would be found at the upper part of the door of the fortress. These people when questioned before me declared the same. And in fact, upon the old gate which remains until this day as a remembrance of the ancient fort, are seen sculptured figures representing a king and a queen of Portugal.

Many others whom I questioned on the same subject assured me that they were descendants of ORANG PUTI, that is, of Europeans.

Several persons have related to me that a report exists that at different times descendants of Europeans after having committed crimes, had fled into the interior of the Peninsula and established themselves, there, in order to avoid the punishment of the laws.

Besides I remarked that these Jakuns whom I speak of now, have the general physical appearance, the lineaments, and chiefly the form and the colour of the body entirely similar to those of the common and low class amongst the Portuguese of Malacca.

A small number of Portuguese words they use would also seem further to direct our attention to that opinion, so that it would not very possibly be far from the truth, to call them the descendants of Portuguese, at least by their fathers side, who in imitation of Tu Puttair, may have taken to themselves wives from among the Jakun damsels.

The second class of Jakuns, that is, those of Johore, are more numerous than those the preceding and are a finer race of men; to whom I will apply what Lieut. Newbold says of the Jakuns in general, that their physiognomy, their lineaments, etc. point to a Tartar extraction. I had during my stay in China several opportunities of examining the Tartar soldiers of the celestial empire, and when I compare them with those Jakuns I can scarcely see any difference; but it is chiefly in the appearence of the eyes and in the nose that I found the resemblance perfect. So I see no objection, until further information or discovery, to coinciding with the opinion of Lieut. Newbold upon this point. But though this may be the case for almost the whole of them, I must observe nevertheless that a few of them form an exception to this rule, and bear the Arab stamp. Such were, amongst others, two individuals I found on the extremity of the Banut river, who might pass as two of the finest Arabs. One of them, the son of a chief, is of about the same age and the perfect likeness of the present sultan of Johore, Tuanku Alli, who is one of the finest Arab descendants I have seen in the Straits.

The third class of Jakuns, those of the Menangkabau states, seem to present the greatest difficulty in an inquiry as to their origin. How can they be considered as of Tartar extraction? All the Tartars I have seen, were tall, at least as tall as the middle sized European, and many of them were taller; with expressive eyes, and a nose which did not recede at the upper part; the facial angle also was apparently much the same as that of Europeans. But on the contrary the Jakuns of the Menangkabau states are very short, their eyes though expressive, are not so much so as those of the Tartars, the nose receded at the upper part, and with the facial angle extremely acute.

The people to whom these Jakuns bear the most resemblance are

Malays of the Menangkabau states. But we cannot infer from that, that they descend from these Malays; as we know by history and tradition that they were in the Peninsula before them; and that the Menangkabau Malays descend from Jakuns by their mothers side, as we have seen when speaking of the arrival of Tu Puttair; which explains sufficiently the resemblance we perceive in the Malays to the Jakuns.

It is really very difficult to discover what occured many centuries ago among a people so entirely ignorant that each individual knows scarcely what occured during the life of his own father; and where there is no writing or any memorial to record the facts of the time past.

In such an incertitude I will beware to combat any opinion: but I will say, at least, that if we consider these Jakuns as descendants of Tartars, we must admit too, that they are much degenerated.

When Dr. Ivan physician to the French Embassy to China passed by Malacca in 1845 I intended to show to him the skulls of some dead Jakuns, as I knew his peculiar knowledge in natural history; and as he has collected skulls of very numerous civilised nations and wild tribes, I doubted not that the inspection of the Jakun's skull would have enabled him to say from what branch of mankind they spring, or at least to give satisfactory probalities on that subject; but the difficulty of procuring such a specimen prevented me from a means of information, from which I had hoped much light might have been thrown upon the subject.

PHYSICAL APPEARANCE AND CONSTITUTION.

There is a remarkable difference in the physical appearance of the several classes of Jakuns. Those of Malacca are generally as tall as the common run of Europeans; they are more dark than any other of the wild tribes that fell under my inspection; and in which respect I do not see much difference between them and the more dark of the indo-Portuguese of Malacca. I have already said that I have generally found a peculiar resemblance between these two classes of men; this agreement is principally to be observed in the conformation of the arms and of the legs, and in the features of the face; but

it is in the length and in the developement of the bones that the analogy is the most perfect. I much desire to examine this fact by anatomical comparison ; but the difficulty to find subjects, and various peculiar reasons have until now prevented me. I will observe nevertheless that though this is the case as respects the greater part of them, it is not without its exceptions : but as we examine here the conformation of a people, we must take that of the great bulk of its individuals, and consider that of the others, as exceptive occurrences, although pretty numerous. I will remark too that many of these Jakuns differ from the indo-Portuguese of Malacca in the frizzled look of the hair.

The Jakuns of Johore* are a fine race of men ; many of them are taller than those of Malacca ;the face also expressive and well characterized, and the expression of the eyes in many of them is a little severe ; I have already observed that their nose does not recede at the upper part, neither is it so flat or so broad at its base, as this feature in the Chinese, Cochin-Chinese and pure Malay. I have found several of them with hawked or aquiline noses which put me in mind of the faces I have seen in Europe, so were thus amongst others, two sons of a great Panghulu Batin who lives at the extremity of the Johore river. I remarked also some beautiful children and many good looking young men. I have not met any of them with corporeal defects ; and the floridness and the regularity of the features in a few old persons were a witness that their life had been passed without infirmity as well as without anxious care. The men are healthy, but generally thin ; the women on the contrary are plump, and though healthy too are not particularly stout.

The third class of Jakuns, those of the Menangkabau states, are very short, their physiognomy is low, and seems to announce great simplicity ; many of them are ugly and badly made indicating a degenerated race ; they have the inferior part of the nose depressed though not flat ; and the two wrinkles so remarkable in many Malays chiefly of low birth, cutting the forehead perpendicularly and terminating

* See vol. i. p. 249.

on the both sides of the nose. Their mouth is pretty well; for though their lips project little yet they are generally well formed. I have already observed that this class of Jakuns bears a great resemblance to the Malay; or at least to many of the Malays.

I must here observe that the description which I am now giving of the physical appearance of these different classes of Jakuns only applies to the greater number of those who compose these several classes; for I have never seen any nation, which presents so great a variety in physiognomy. It would be very difficult to characterize the variety of features I have seen amongst them; several of them put me in mind of some of the Tagals or natives of the Philippines. I have observed at Manila: many others appeared to me to have the likeness of Spaniards of my acquaintance; whilst others have the hair and features approaching to that of the Caffree.

The constitution of the Jakuns is generally strong, and the habit in which they live of being deprived of so many things which by our civilised manners are become for us so many necessities, renders them able to undertake long journies with but a slender stock of provisions, and to keep themselves healthy and strong upon what would be scarcely sufficient for us to live: and thus to bear hunger and thirst for a long time, walking and carrying heavy loads; certainly in that respect their conformation is superior to ours, even when living in Europe. Their nervous system is strong; and their bodies are very muscular. I have seen some who though very thin were nevertheless unusually muscular. This I suppose may account for their perspiring much less than we do. That they do not perspire is fortunate for any European who has occasion to be in frequent communication with them; for when they perspire their bodies exhale a strong and fetid odour like that of a wild beast, and probably from a want of attention to clean their bodies at proper times; this bad smell is also perceived even when they do not perspire, but then much less so; and not to an extent to incommode any except the more delicate. The hair of the Jakuns is black, ordinarily frizzled, but very different from the crisp hair of the Caffree. Some of them leave the whole to grow, and turn it round the

head, as the Cochin Chinese; others, as many of those of Malacca, cut theirs entirely; others, chiefly of the Menangkabau states and of Johore, shave the head, leaving it only at the crown above three inches in diameter where they never cut it, the same as the Chinese; and to prevent this head or hair from being hooked by the branches of trees in their silvan habitations, they tie it up in the form of a top knot. They have scarcely any beard, and many of them have none at all. The women leave their hair to grow, and then tie it up in the same way as the Malay women; but as they have but little occasion to care much for appearance, it will be easily imagined that they are not very particular in this respect.

I was told that in the forests of Pahang are found numerous tribes of Jakuns, who are as white as Europeans: that they are small, but very good looking; and the Malays are very fond of catching them. For this purpose they form a party and beat the forest in order to catch these poor creatures, just as a troop of European hunters pursue fallow deers. When they succeed in their chase they take them to Pahang or to Siam, where on account of their whiteness and comeliness they sell them very dear. Other persons who have also seen this species of Jakuns, tell me that they are not as white as Europeans, but that they approach more to the colour of the Chinese, which is the most probable.

INTELLECTUAL FACULTIES, KNOWLEDGE.

Both the intellectual faculties of the Jakuns and the knowledge they evince are very limited; the reason of which is, I think, not the defect of the faculties themselves, so much as really the want of means to develope their intelligence. They are indeed very ignorant but they are also certainly able of acquirement; they are endowed with a sound mind, a right judgment, and a good memory. I have never found among them any either insane or idiotical; all I have seen were more or less intelligent, and I always found their intellectual faculties in a sound state, corresponding to the common and ordinary rules of nature. I doubt not but that if they were to receive the same care that is given to European children they would

become equally intelligent, and possibly more susceptible of a good education than a great part of the natives of India. If the Missions which are now to be established among them succeed they will clear up these conjectures. A great part of the Jakuns know and acknowledge the existence of a supreme being; they call him by the Malay name *Tuhan Allah*, the Lord God. Many of those of Johore know and acknowledge too the truth of a punishment for the man who commits sin; some of them acknowledge that punishment in a general way, but by what means it is to be executed, they do not know: some others, but few, declared to me openly that after death, sinners will be thrown into the fire of hell: but they do not know any reward for good men and good works. Those of the Menangkabau states, probably on account of their more frequent communications with the Malays, are more learned in divinity; some of them spoke to me of God as the creator of every thing, of Adam, as the first man, of Abraham, Moses, David, Solomon; but in a very confused way. I have not found amongst them any knowledge of Christ nor of the Christian religion; but I was surprised that having given on one occasion an instruction of the catechism to some of them, and upon asking them again they answered correctly to a good number of my questions. The more learned of them are those who are called Pawang; I will speak of these in one of the next articles. The most ignorant in religious matters are those of Malacca. A subject of surprise is that though many of them acknowledge the existence of a God, of a creator, they have not amongst them a single religious practice, and not only they do not practice exterior forms of worship, but from inquiries from them I find that they have not the slightest feeling either of thankfulness or of love for the Being they call their creator. All their knowledge in religion is merely theoretical. They do not worship the sun nor the moon nor any idol; what Lieut. Newbold said on that matter must be understood of some other tribes.* The knowledge of the Jakuns in the art of physic is very confined; they use very little medicines, and those of them who are sick,

* See on the religion of the Binua of Johore, *ante*, vol. i. p. 275, 279, on that of the Mintira *ib.* p. 275, 282, 307, 325, &c.—Ed.

are almost without assistance, and the sickness is ordinarily abandoned to the ordinary course of nature: notwithstanding the Malays consider them as clever physicians, and in their stupidity they believe themselves very fortunate when with money or by giving them cloths they succeed in obtaining from these poor people some medical prescriptions. The following is a specimen of such recipes, probably purloined with great devotion by some superstitious Malay; it is cited by Lieut. Newbold. "A person with sore eyes must use a collyrium of the infusion of Niet-Niet leaves for four days. For diarrhœa, the decoction of the root of kayu-yet, and kayu-panamas; for sciatica powdered sabtal-wood in water, rubbed on the loins: for sores, the wood kumbing. If the head be affected, it must be washed with a decoction of Lawang-wood; if the chest, the patient should drink a decoction of kayu-ticar leaves." Some of the Jakuns, but few, and only those who are styled Pawangs, pretend to some knowledge in physic, as well as in the secrets of nature; but their pretensions on that point are not so great as it is ordinarily reported; and in fact they are very little more clever than the others.* The Jakuns have some knowledge of music, they have several songs which they received from their ancestors, or which they make themselves, only according to the agreement of the ear, for they have not the slightest idea of the musical notation; their songs are generally rude, and agree perfectly with the austere aspect of their habitation; I have heard them too singing in a melancholy tone, chiefly during the night. Their songs though rude are not altogether disagreeable to European ears, provided they be not too delicate. I was much surprised to remark that though they are entirely ignorant of our European music, which they have never heard, yet in great part of their songs, they proceed by thirds and by fifths assuredly without being aware of it, but only guided by their ear; which confirms the opinion of our European musicians who affirm that the third, the fifth and the octave are found in nature itself; and what I myself have many times observed in any sound, principally in that of a bell, that

* See vol. i. p. 277.

there are three sounds which are at once to be distinguished with some attention, viz., the diapason, the third and the fifth. Some authors speak of a kind of violin and of a rude flute used by the Jakuns. I have never seen these instruments, but I know that they use two kinds of drum like those of the Malays. The Jakuns know the Europeans by report only, the greater number of them having never seen any European. On account of the great number of Chinese emigrants, who inhabit the Peninsula, few of them are unaware of the existence of China; they are told too of Bengal, of Sumatra, and of Siam; these are the boundaries of their knowledge in geography. Their science in astronomy is yet more limited; they see the sun rise and set every day; that the moon sometimes appears, sometimes not; they use their light when present, they sleep when it is dark; but they have never noticed or inquired about the course of the stars: they scarcely know how many days are in the duration of a moon, and how many moons in the year, they are not at all aware of their age, nor of that of their children; such observations or remarks appear to them mere superfluities as being not required in their way of living.* An ignorance of such matters amongst savages is not surprising when I mention that the Malays themselves who live in the interior of the Peninsula are not aware of all these things, and that on these subjects many of them are no better informed than Jakuns. A thing in which the Jakuns (only those of the Menangkabau states) are truly skilled, is the art of using the Sumpítan and poisoned arrows; as I will have occasion to mention when speaking of their weapons. They have no knowledge of writing nor do they make use of any symbolical signs. The language spoken by the three classes of Jakuns I describe is not entirely the same, but the difference is not considerable, and I think that it consists in the intonation and the pronunciation, but chiefly in the inflection upon the termination, more than in the words themselves; which are the same except a very small number. The Malays say that the Jakuns speak a low Malayan language; but in my opinion, I would think

* See vol. i. p. 283.

on the contrary that they speak the purely Malayan, without any mixture of Indostanee or Arabic: I will say nevertheless that those of them who are much in communication with Malays have admitted many words of these two last languages and even some of the Portuguese. They have also adopted several circumlocutions and expressions used in the Malayan language of courtesy, as for instance, in addressing, the terms Abang, Kaka, but I remarked that they use such appellations and many other expressions of courtesy, received in Malay only when they are in the presence of Malays. The following answer given by the chiefs of the Jakuns of the Menangkabau states, who were summoned to the presence of king Mahomed Shah, may be considered as a specimen of their style and literature as well as explanatory of their manners and customs:* "We wish to return to our old customs, to ascend the lofty mountain, to dive into the earth's deep caverns, to traverse the boundless forest, to repose, with our head pillowed on the knotted trunk of the Durian tree, and curtained by Russam leaves. To wear garments made from the leaves of the Lumbah or Terap tree, and a headdress of Bajah leaves. Where the Meranti trees join their lofty branches, where the kompas links its knots, there we love to sojourn. Our weapons are the tamiang (or sumpitan), and the quiver of arrows imbued in the gum of the deadly Telak. The fluid most delicious to us is the limpid water that lodges in the hollow of trees, where the branches unite with the trunk; and our food consists of the tender shoots of the fragrant Jematong, and the delicate flesh of the bounding deer."

The Jakuns are entirely ignorant of the first principles of mathematics, nor do they know the simplest rules of arithmetic. The mathematical instrument which probably gave origin to the decimal calculation, the natural indigitation, is adopted by them in ordinary use.

* This passage, we suspect, should be received as a specimen of Lieutenant Newbold's style of poetical prose. It is evidently a paraphrase by him of the original *Malayan*. Newbold's Political and Statistical account of the British Settlements in the Straits of Malacca vol. II. p. 391. ED.

All those persons who have spoken to me of the population of the Jakuns were much mistaken. The desire of finding extraordinary things, and the natural propensity to fancy the marvellous, which are found in every nation, and chiefly amongst the ignorant, are in their apogee in the imagination of Indian nations, who, generally speaking, are very uninformed, and this was probably the first cause which gave rise to the many hyperbolical stories which have been spread abroad about the number of the Jakuns; as well as about their manners and customs. In fact it is very difficult to ascertain the true number of the Jakuns, because part of them are a nomade people, so that the same family, the same individuals appear today in one place, and next week, two or three miles farther; next month, they will remove again, to roam the forest or to come to their first habitation; so that those who perceive them here and there imagine that these are fresh persons, and in their calculation they count two or three times the same. The number of Jakuns reported to me was always much more considerable than the number I found upon visiting the places themselves. As I have not visited the entire Peninsula it is yet difficult for me to ascertain the amount of these inhabitants of the Jungle. I will however here state what appears to me to be an approximation to the truth.

The number of the Jakuns whose existence is known to me with certainty, that is, those I myself visited, and who fell under my immediate inspection, amount to no more than one thousand. Those I know only by information would amount, I suppose, to about three or four thousand; the whole to five thousand at the most. They are distributed in the following way. Those I termed Jakuns of Malacca, are the least in number, and cannot be more than three hundred, about one half of whom I have seen in the following places; viz. near Reim and Ayer Panas, at Ayer Baru, Gassim, Kommender, Bukit Singhi; in the river of Muar near Pankalang Kota, at Poghalay, Sagil, Segamon, Lemon, Jawee; in the small river of Pago, and in that of Ring. The remainder are to be found, at Bukit More, Ayer Tross,

Bukit Gadong, Tanka, and it is reported there are a good number at Segamet. Those I styled Jakuns of Johore, because they inhabit that part of the Peninsula which is under the sway of the sultan of Johore, cannot amount to more than one thousand, scattered over that large extent of country; from two to three hundred fell under my inspection at the following places; at the extremity of the Johore river, where there are several hundred of them living under a Panghulu Bateen, duly appointed by the late sultan of Johore, and by the present Tammungong of Singapore; at a place entirely in the interior of the Peninsula called Kembao,* and at the extremity of the Banut, river; the others I have not seen are to be found at Pontian, Ayo, Klambo, on the river of Batu Pahat, the Rio Formosa of the Portuguese, and in several other places. Those I called Jakuns of the Menangkabau states, I suppose to amount to about three thousand; I have seen only a few hundred of them, at Sungie Ujong, where they are at least five hundred, at Jellabu, at Rumbow and at Johole where they are in small number; and on the Company's territory at Rombia where there are now one hundred. Those I have not visited are to be found at Sriminanti, Ulu Muar, Jelley, Lingi, Langhat, Ulu Coleng and in the whole of the mountainous chain running down the middle of the Peninsula until Kedah. I am induced to believe that those who are said to inhabit the forest of Pahang are an extension of those of the Menangkabau states,† except perhaps those who are white whom I have already mentioned. During the last few months many families of the Jakuns of Sungie Ujong have come into the Company's territories. From what I can learn the following seems to be the cause of that emigration. About the month of May (1847), some Jakuns having killed several elephants took the liberty to sell the ivory tusks and to apply the price of them to their private use; which the Malay chief of that place pretended to be a violation of his rights, and

* The author omits the Binuas of those portions of the Simrong and other branches of the Indau which are in Johore. see vol. I. p. 240. ED.

† This is true with respect to the central and northern parts of the interior of Pahang, if we may trust accounts which we have received from Mintira, and also from Malay traders who have crossed from Malacca to Pahang. But the southern part of Pahang is inhabited by the same tribe of Binua who are found in Johore. (See *ante* vol. I. p. 217). ED.

consequently sent armed Malays with orders to kill these poor people; as such a crime could only be atoned for by the death of the guilty parties; seven persons were killed and wounded and many others fled to different places, and some came over to the territory of Malacca where they find more security and protection; and established themselves at Rombia, Malacca Pinda, Bukit Berdam. The places more commonly frequented by the Jakuns are the neighbourhood of mountains and the borders of rivers. I had been told that many lived around the base of mount Ophir; and possibly this was so a few years ago; but in the month of June of the present year (1847), I visited the place, and made a circuit of mount Ophir, and of the neighbouring mountains, without observing any of them; I found indeed several places where formerly had been villages, and also many ruined habitations. I likewise observed several places which had been formerly cultivated by the Malays and possibly also frequented by the Jakuns; but they were then entirely deserted, and already covered with Jungle. A few Chinese who employ themselves in extracting the gold from the mines, are the sole remains of a large population of Malay cultivators and of Chinese miners both of whom a few years ago were located at the gold mines, which notwithstanding do not yet appear to be exhausted. This is the effect of the misrule of Malay countries. The melancholy sight of such places, rich both in mines and vegetation, excites a regret that they are not under a wiser government.

HABITATIONS.

Before I had myself visited the Jakuns, report induced me to consider them to be as savage as wild beasts; and sleeping like birds on the branches of trees. Even now when I question the Malays on the subject, some of them answer the same; but this is far from the truth, there is no Jakun without some dwelling, more or less well ordered. Some of them indeed have habitations which can scarcely be called houses; but these are very few; and for the most part they have houses. The Jakuns of Johore build houses in the Malay way, some of which are fine buildings. I found several which were much

more comfortable than any Malay house I have seen in the interior of Johore: such are the houses of the Panghulu Batin on the river of Johore, and that of a Jakun chief on the river of Banut; these two houses were divided into several rooms, some of which were for the private accommodation of the Jakun ladies of the family; the furniture consisted of some pots, plates, several other vessels and a good quantity of mats: other houses were much more common, but yet pretty comfortable, clean, and always divided into two or three rooms at least, and furnished with a frying pan of iron to cook rice, a few shells of cocoanut to keep water, and baskets used to bring food. All those houses are raised about six feet from the ground, and are entered by a ladder like the Malay houses.*

The best houses of the Menangkabau Jakuns are about the same as the more simple and common houses of the Jakuns of Johore, the others are as described by Lieutenant Newbold "rude edifices on the top of four high wooden poles; thus elevated for fear of tigers, and entered by means of a long ladder, and presenting, viewed through certain holes which serve as doors, no very satisfactory appearance to the uninitiated. The roofs are often thatched with Chucho leaves. There is but one room, in which the whole family is huddled together with dogs and the bodies of the animals they catch. The huts are so made as to be moveable at a moment's warning; they are ordinarily situated on the steep side of some forest clad hill, or in some sequestered dale, remote from any frequented road or foot-path, and with little plantations of yams, plantains, and maize; some have also fields of rice about them. The bones and hair of the animals whose flesh the inmates of these scattered dwellings feed upon strew the ground near them, while numbers of dogs generally of a lightbrown colour give timely notice of the approach of strangers."†

The Jakuns of Malacca whom I characterised as the most ignorant, are also the poorest and most miserable, their best houses are about the same as the worst of those of the Menangkabaus, and I found several families who lived without even having any house at all.

* See *ante* vol. I. p. 253. † Newbold, vol. ii. p. 404.

These gather themselves together to the number of five or six families, they choose a place in the thickest of the forest, and there they clear a circle of about thirty feet in diameter; having cleared this space they surround it with the branches of the trees they have just cut; to this they join other thorny branches they collect from other parts, and so make a sort of bulwark against tigers, bears and panthers, which are there in good number. Having done this they proceed to establish their dewlling in this enclosure, in the following way: each family works to construct what will serve for a bed during the night, a seat in the day time, a table for the repast, and a dwelling or shelter in bad weather; it consists of about fifteen or twenty sticks of six feet long, laid one beside the other, supported at the two extremities by two other transverse sticks which are set upon four wooden posts; the whole being about two feet in height, four feet broad and six feet long. One dozen Chucho leaves gathered by their ends, tied at the head of the bed, extend themselves and cover it until the other extremity: these beds are placed around the enclosure, in such a way that when all the persons are sleeping every one has his feet towards the centre of the habitation which is left vacant, to be used as a cook room, or for any other purpose.

DRESS.

The cloths of the Jakuns (when they use any) are ordinarily the same as those used by the Malays, but poor, miserable, and above all very unclean; many of them use cloths without washing, from the day they receive or buy them, until they become rotten by use and dirt; and they are obliged to throw them away: If some vermin are found, which is often the case, principally upon the women who are more dressed, they are immediatly eaten with delight as in Cochin-China. If many of them are badly dressed, and some nearly naked, it is more from a want of clothes than in accordance to their own wishes, chiefly amongst women; for all desire to be clothed, and the most agreeable presents which can be offered to them are some trowsers, sarongs, bajus, or some handkerchiefs to put round their head, as is the Malay fashion. Those of them who go habitually nearly naked,

do not appear so before strangers, excepting they have no clothes. The Jakuns of Johore, who are superior to the others in many respects, as can be inferred from what has been said, are also the best dressed; their women are much the same as Malay women as to dress, and the order of their appearance; having also a great number of rings on their fingers, some of which are crystal, some of copper, and some of tin; but also a good many of silver; they take a peculiar pleasure in these ornaments, as well as in silver bracelets.* The men have at least trowsers, a small baju and an handkerchief for the head. The Jakuns of the Menangkabau states, have the same dress as is used by the Jakuns of Johore, and the women the same ornaments, but are not so well clothed; many of them go nearly naked, at least near their houses; and those who use clothes, show often an embarassment which proves that they are not accustomed to their use. The Jakuns of Malacca are badly dressed, many of the women have only a sarong, and, if they are married, a ring, the necessary present of the husband before he marries them. The greater part of the men have nothing but a strip of the fibrous bark of the Terap tree, beaten into a sort of cloth of a reddish brown colour, called a sabaring, round their loins; part of this comes down in front, is drawn between the legs and fastened behind.

OCCUPATION.†

Like all Indian nations the Jakuns have a propensity to idleness; but to be exact in this account, and just towards them, I must say that they are not so lazy as either the Malays or Hindoos. Their first and principal occupation is the chase; they have a great predilection for this exercise, it being the first means by which they feed themselves and their families; and from having been brought up in that habit, in which the greater part of their life is spent, they should be skilful hunters, and which in fact they are, both in their way and in the manner of using their weapons, as I will say hereafter. When there is no more food at home, the husband leaves home, beats the

* See vol. i. p. 252.

† *Ib.* p. 255-263,273.

forest, and sometimes returns with large pieces of venison, but sometimes with nothing; and on such days they go to sleep without supper. This is the ordinary evening work; when the sun is near setting. In the day time they remain at home where they prepare arrows and the weapons, the matter with which they poison their arrows, they cook and eat the animals caught the day before, and build or repair their houses etc. Many of them cultivate plantains, yams, which they call klades, and several other vegetables. I have seen amongst the Jakuns of Johore some who had large fields of rice: They cultivate this grain in the following way: they choose in the forest a place where the ground appears to be favorable for such a purpose, they cut all the trees, in a space more or less large according to the number of persons and the quantity of rice they intend to plant; they put fire, and burn all these trees that are fallen pell-mell; when the branches are burnt the fire ceases, and some time after the rice is planted, it grows up amongst all the trunks of the fallen trees, and other larger branches which were not destroyed by fire: after the harvest the place is abandoned, and another is selected for the next year.*

In several places in the interior of the forest are found durian trees, always in a body together to the number of about ten or twelve trees: such places are for the Jakuns an object of great attention, and a matter of work, They cut with great care all the other trees which surround the durians, that these by receiving more air may grow up more easily, and give finer and greater quantity of fruit; they build there a small house of which I will hereafter speak, and they then return to their ordinary habitation, which is sometimes distant from such places one or two days journey. The Jakuns who have no taste for cultivating rice, or who are not acquainted with the manner of doing so, are generally very miserable; they are then obliged to look to the Malays, to provide for their livelihood: they traverse the Jungle all the day seeking after ratan, dammar, garu wood, and several other articles of commerce; the next morning, they

* See vol. I. p. 255, 320.

go to some Malay house, where they dispose of the produce of their search, receiving in return, a small quantity of rice, some times scarcely sufficent to support their family for that very day; after that they return to the same thing for the purpose of in like manner procuring food for the next day; and so on. Where the Chinese work in the tin mines, they employ sometimes Jakuns as workmen. I am told that at some place in Jellabu, Jakuns work the mines by themselves, and bring the tin to Pahang, where they sell it. In some other places Malays employ Jakuns to cut jungle where they intend to cultivate; and in several other works; but there is a general complaint on the side of the Jakuns, who say that the Malays are not just towards them, and recompense not properly their labour. The business of the Jakuns women is to take care of the children, to cook and prepare the food; and to go about the forest to look for fruits and vegetables.

FOOD.*

After what has already been said of the Jakuns, it can be easily understood that they have no regular diet. They like good food, but when they are deprived of it, they eat with satisfaction any other, even that which would be an object of horror for civilised people. They live upon the flesh of every kind of animal, snakes, monkeys, bears, deer, tigers, birds, etc. Yams, Plantains with the wild fruits, the leaves of trees and certain roots furnish the principal part of their ordinary food. Those of them who cultivate rice, sell a part of it to the Malays, or exchange it for cloths: with the other part they live a few months of the year. They do not dislike the flesh of domestic animals, fowls, &c., as it had been alleged; on the contrary, I remarked that they prefer it to that of wild animals. I have seen several of their houses where there was a good quantity of fowls. Sometimes they cook the flesh before they eat it: but at other times they eat it raw: some merely put the animal upon the fire till the hairs are singed, when they consider it as cooked. I have seen some large mon-

* Vol. I. p. 251-260.

keys which, after having been thus cooked, were dished up upon a kind of mat as a meal to some seven or eight persons, who speedily devoured the whole in a few minutes, leaving only the skeleton. In eating they use no dish; an iron frying-pan serves for cooking, plantain leaves serve as plates, and some cocoanut shells form their usual drinking cups. Some Jakuns refuse to eat the flesh of Elephants, under the pretext that it would occasion sickness: but many others are not so scrupulous. When an elephant is killed either by themselves or by the Malays, they call together their friends and relatives to partake of the large entertainment which is prepared; they then build houses in which to lodge their guests, until the animal which furnishes the feast is entirely finished: then every one decamps, and returns to his usual way of living. When the durian season is come, a good number of Jakun families leave their houses, men, women and children repairing to the places I mentioned before, where are found durian trees. They then again clean the ground in order to find more easily the fruit, which falls when ripe, and, dwelling in the small house of leaves, prepare themselves to enjoy the treat which nature presents to them. For six weeks or two months they eat nothing but durians. When the season is over, the place is abandoned until the next year.*

I observed that one of their most prised dishes is a honey-comb, and let it be said with due respect to the opinion of our European cooks, the time when the honey is in the comb is not amongst these epicures of nature considered the proper moment to take the hive; but they wait until the small bees are well formed in the cells, and a few days before they are ready to fly away the honey-comb is taken with great care, and, wrapped up in a plantain leaf, is put upon the fire for a few minutes, and then wax, and animals are devoured together,and considered as an uncommon treat.

The Jakuns chew betel leaf together with the areca-nut and gambier; but for the want of the betel-leaf, they use the leaf of a tree called kassi. Tobacco, when it can be had, is much used, even by women and children, in chewing and smoking.†

* See Vol. I. p. 259. † *Ib.* p. 255.

WEAPONS.

The Jakuns of Malacca, and those of Johore have no other arms than spears and parangs; very few use the sumpitan, and they are entirely unacquainted with the use of poisoned arrows.* The Jakuns spears consist of an iron blade of about one foot long, and one inch broad in the middle, attached to a thick rudely worked shaft about five or six feet long, and sharp at the inferior extremity, in order to enter easily into the ground; for before they enter a house they strike the end of the spear into the ground, where it remains until they go away.† It is scarcely possible to meet a single Jakun without his spear, which is both a stick to walk with, and an offensive or defensive weapon as the occasion requires. The parang is an iron blade of about one foot long, and two or three inches broad with a haft like that of a large knife; they use it to cut trees employed in the building of their houses; and to cut branches to open a passage when journeying in the thick jungle: it is also used as a defensive weapon against wild beasts. I know a Jakun who being attacked by a tiger, defended himself with a parang (the only weapon he had with him at the time). Nearly half an hour was spent in this singular combat: the Jakun lost an eye and was seriously wounded in the head; but the royal beast paid the forfeit with his life. The Jakuns of the Menangkabau states use the parang, the sumpitan with poisoned arrows, and a few of them the spear. The sumpitan is a small bamboo of the size of the index finger, from six to ten feet long with a head as large as a fowl egg, this piece of bamboo is inserted until the head into a larger one of the same length. The arrows are very slight slips of wood the thickness of a knitting-needle, and from eight to ten inches long terminating in a fine point, coated with poison for the space of an inch or so; at the other extremity of the arrow, is placed a cone of white wood, cut in such a way that it may just fill the tube of the sumpitan to receive all the impulse of the air, and this cone also aids in directing the arrow; this is propelled by

* Vol. i. p. 272.

† This is also the custom of the Jobore Binua, *ib.* p. 257. ED.

collecting air in the lungs, and strongly emitting it into the head of the sumpitan partly inserted into the mouth of the projector. The range, to take proper effect, is about seventy or eighty feet; some can reach one hundred and forty or fifty feet; but then there will be little chance of being dangerously wounded.*

MARRIAGES.

Marriages are ordinarily celebrated about the months of July and August, when fruits are plentiful. The bridegroom frequents for some time the house of his intended, and when he has obtained her consent, he makes a formal demand to the father. A day is then appointed; and an entertainment is prepared, more or less solemn, according to the means of the two contracting parties, and their rank in the tribe. When the day of the marriage is arrived, the bridegroom repairs to the house of the bride's father, where the whole tribe is assembled. The dowry given by the man to his intended is delivered, and must consist at least of a silver or copper ring, and a few cubits of cloth: if the man is not poor, a pair of bracelets. Some other ornaments, and several articles, as of furniture for the house of the new family, are added. Sometimes the woman presents also some gifts to her intended. Then the bride is delivered by her father to the bridegroom, and the solemnity of the wedding begins. Some others state that amongst some tribes there is a dance in the midst of which the bride elect darts off into the forest, followed by the bridegroom. A chase ensues, during which, should the youth fall down, or return unsuccesful, he is met with the jeers and merriments of the whole party, and the match is declared off. This story was related to me, a little differently by a European who inhabited Pahang many years. During the banquet a large fire is kindled, all the congregation standing as witnesses; the bride runs round the fire: the bridegroom who must run in the same direction, follows her; if he catches her, the marriage is valid; if he cannot it is declared off. All the Ja-

* See the *timiang* or *sumpitán* used by the Mintira and other Bermun tribes described *ante*, Vol: I. p. 272. A principal defect of the weapon is that, from the excessive lightness of the darts or arrows, a puff of wind affects their direction. Ed.

kuns I questioned on the point declared to me that they were not at all aware of that practice; which proves that if the story is true, it must be referred to a few tribes only. No marriage is lawful without the consent of the father. Conjugal faithfulness is much respected amongst the Jakuns; so that adultery is punishable by death. It is peculiarly remarkable that the Jakuns, though surrounded by Mahommedans and heathens, who all are so much addicted to polygamy, have yet keep marriage in the purity and unity of its first institution; it is not allowed to them to keep more than one wife; I met only one who had two, and he was censured and despised by the whole tribe. I was much surprised to find such a custom amongst these wild tribes; a custom which can scarcely be found to exist in any but christian nations; but nevertheless with this difference, that amongst them a man can divorce his wife and take another. The form of divorcing is, that if the divorce is proposed by the husband, he loses the dowry he has given to the woman; if the woman ask the divorce, she must return the dowry she received. The children follow the father or the mother according to their wishes; if they have not yet the use of reason, they follow the mother.

BIRTH.

No assistance is ordinarily given to lying—in women; their physicians or Pawangs are not permitted to appear in such circumstances, and midwives are not known amongst them. It is reported that in several tribes, the children, as soon as born, are carried to the nearest rivulet, where they are washed, then brought back to the house, where a fire is kindled, incense of kamunian wood thrown upon it, and the child then passed over it several times. We know from history that the practice of passing children over fire was in all times much practised among heathen nations; and that it is even now practised in China and other places. A few days after the birth of the child, the father gives him a name, which is ordinarily the name of some tree, fruit or colour.

SICKNESS.

I have already said that the Jakuns were not much subject to sickness; notwithstanding, on account of want of proper care, few of them reach to an advanced age. The sickness of which they have the greatest dread, and from which they suffer most, is the small pox. Is any one attacked by it, immediately he is entirely abandoned; parents, relations, friends and neighbours fly away, and the poor sick man, thus left without any assistance, of course dies miserably. In their other sicknesses, they are not so entirely uncared for; some physic, consisting ordinarily of an infusion or decoction of wild plants, is given according to the rude prescription of a Pawang, but ordinarily without any success. They mostly die of fever caused by the dampness and insalubrity of the places they inhabit; like the people of India they are generally very subject to ulcers. Many of them have also disgusting skin diseases, but ordinarily not dangerous. I think that, if the Missionaries succeed in gathering the Jakuns into villages as they intend to do, and to make their habitations more salubrious, ulcers amongst them will be certainly much more scarce; and I hope the cure of their skin diseases would not present great difficulty. A small provision of quinine or some other remedies for fever would also doubtless preserve the life of many.

FUNERALS.

The preparations they make for their funerals are few and simple. If the decease took place before noon, the body is buried the same day; if after noon, the funeral is deffered until next day. The corpse is washed, wrapped in some cloth, and interred by relations and neighbours, in a grave about four or five cubits deep. The sumpitan, quiver of arrows, knife, &c., of the deceased are buried with him; along with some rice, water, and tobacco. I questioned them respecting the reason of burying such things with the deceased, but I could not obtain any answer except that this was the custom practised by their ancestors, and followed by them. This practice is not peculiar to the Jakuns; we know from history, that many of the

ancient people did so; and that such a custom is even yet followed amongst some Tartar tribes. Like many other people, the Jakuns consider white as a sacred colour; and it is a peculiar subject of comfort, when in their last sickness, they can procure for themselves some white cloth, in which to be buried. When too poor to obtain such a consolation, the Terap bark supplies the funeral dress. I was told that amongst the tribes, who are near to Pahang, the corpse of the deceased is burnt as is practised amongst the Hindus, and Siamese. Also that the place where a Jakun died is deserted by the others, and the house burnt; but after having questioned many of them on this last subject, I found it was practised only by a few.

NATURE.

The Jakuns are entirely inoffensive, nature having endowed them with an excellent temper; they are generally kind, affable, inclined to gratitude, and to beneficence. Hospitality is much practised amongst them, not only towards other Jakuns but towards any stranger, who should reach their habitations. I have remarked that all Indian nations are much inclined to begging; thus any thing they see that pleases them, they ask of the owner, when they know that there is no means to steal it, and sometimes their demands are so frequent and repeated that they are very importunate. The Jakuns are not so; they differ much in this respect from other Indians; they are liberal and generous. When I visited them, they very seldom asked me for any thing; and they never refused what I asked from them; and when after asking I refused to take it; they pressed me to do so. They have very seldom quarrels amongst themselves; their disputes are ordinarily settled by their Batins or chiefs, without fighting or malice. Their laws allow of punishment for several sorts of crimes; but the Batin has seldom occasion to apply them. Candour and honesty, qualities very rare in India, and I dare say in all Asia, are notwithstanding found amongst Jakuns. It is remarkable that they abhor lying and thieving, not in words as the Malay, but really and in practise. They are never known to steal any thing, not even the most insignificant trifle. Such remarkable qualities induced several

al persons to make attempts to domesticate them, but such essays have generally ended in the Jakuns disappearance on the slightest coercoin. Mr. Lewis, Assistant Resident at Penang, related to me, that he had for some time a Jakun family in his house; they appeared at first to be very glad of their position, and indeed the remarkable kindness which that gentleman shows to all inferiors, could not fail to please them; but having been one day employed in some servile work, they fled away and appeared no more. The reason is that the Jakuns are extremely proud, and will not submit for any length of time to servile offices or to much control. This, if it is a defect, is the only one I have yet remarked in them.

The Jakuns, by their nature and their peculiar qualities, offer the most encouraging hopes to the Missionaries who will be employed in their amelioration. Few Indians present such good dispositions to embrace the Gospel. With the favour of God and the assistance of those who are in a position to concur in the work, there is a vast deal of good to be effected amongst the Jakuns.

LAWS.

Though the Jakuns are generally good, and little inclined to evil they show notwithstanding, from time to time, though seldom, that, as the rest of mankind, they are in *naturá lapsá*, and participants in the wickedness common to all the children of Adam; from whence the necessity of establishing laws amongst them; but we can say, to their praise, that their laws rather prevent disorder, than punish it. Their laws are not everywhere the same; each tribe has its customs and regulations; I will state here those I observed to be more generally received. They are not written; but they can be expressed in the following way.

Form of Government.

Each tribe is under an elder termed the Bátín, who directs its movements, and settles disputes.

Under each Bátín, are two subordinates, termed Jennáng and Jurokrá, who assist him in his duties.

A fourth title, is that of Páwáng, but it is more a title of honour

than of jurisdiction, and indicates the persons who are generally charged to fulfil the office of physician, and that of teacher.

The functions of the Bátín resemble those appertaining to the Malay Rájáhs. The title of Jennáng is equivalent to that of the Malay Panghulu, or our police magistrates; and that of Jurokrá to that of the men who, in our European governments, are charged to execute the orders proceeding from the police office. There is also a war chief called Pánglímá.

Of the elevation of persons to the Government.

After the death of a Bátín (or chief of the tribe) the eldest of his sons will be presented by his nearest relation, to the whole collected tribe, and will be declared and recognized publicly heir of his father in the Bátínship. If the people refuse to declare him Bátín, the second son of the late Bátín will be presented; if the people refuse this second son and his other brothers, a stranger to the family will be elected.*

After the death of a Jennáng or of a Jurokrá, the Bátín will appoint the eldest son of the deceased to succeed to the office; if the Bátín finds the eldest son of the late dignitary unfit for the appointment, he will name another of the same family, or if there is in the family no proper person to fill the office, he will then appoint a stranger to the family.

Of a person violating the rights to their neighbour in his person.†

If a person kill another without a just cause, he shall be put to death.

* This form of election proves the truth of the principle, that from the very commencement of the social state, the source of all temporal power and jurisdiction, is in the will of the people voluntarily giving up their liberty, and placing it in hands of persons, to whom they are naturally led to look up, and from whom they can receive protection and assistance. In such course of things as remarks wisely some author, laws must have preceeded the knowledge of letters, and the other arts of civilized life; and this we accordingly find to be the case, in the oral traditional code which is in force amongst the Jakuns.

† We may remark in this chapter a perfect identity with the punishment of Talion, given to the Jews by the ministry of Moses.

If a person beat another, he will be beaten in the same way; if he wound him, he will be wounded in the same way.

If a person insult another, he shall pay a fine.

Of stealing.

If any person shall steal the property of his neighbour, he shall return it, and pay a fine to the Bátín.

If a person has already stolen several times, the Bátín will take all his property.

If it is recognized that a person is in the habit of stealing, he will be killed; because it is not considered possible, that a man who is given to such a habit can ever become an honest man.

Of marriages.

No marriage is lawful without the consent of the father.

A man cannot have more than one wife at once.

A man divorcing from his wife looses the dowry given to her.

Ifthe divorce comes from the side of the woman, she must return the dowry, which she received from the man.

Any married person surprised in adultery, shall be put to death.

If the woman surprised in adultery, can prove that she was seduced, she will not be put to death; but she will be sent away by her husband, because it is a shame for a Jakun to keep a wife after she has had commerce with any other man than her lawful husband.

After divorce the man and woman can marry again with others.

Of children.

A father cannot sell his child, but he can give him to another, provided that the child will consent, whatever may be his age.

If children are left orphans the nearest relations will bring them up; unless with their consent another person agrees to fulfill that duty.

Of inheritance.

After the death of parents the whole of their property will be divided amongst all the children in equal parts.

It is related by different persons that the Jakuns have great influence in the respective Malay states where they are living: and chiefly in the election of Malay Panghulus in the Menangkabau states. Lieut. Newbold too says the same; and confirms it by the following fact.—"A few years ago the late Panghulu of Sungei Ujong, Klana Leher, died, leaving two nephews, Kawal and Bhair. It is an ancient custom prevalent still in the interior, and I believe, generally throughout Malayan nations, that when a chief dies, his successor must be elected on the spot, and before the enterment of the corpse (which is not unfrequently deferred through the observance of this usage to a considerable length of time;) otherwise the election does not hold good.

"Now it happened that Kawal was absent at the time of Panghulu Leher's death. The three sukus and one of the twelve Batins took advantage of Bair's being on the spot, elected him, and buried the body of the deceased chief. Against this proceeding, the Rajah de Rajah, and the remainder of the elective body, the eleven Batins, protested; a war ensued, which terminated in 1828, pretty much as it began. Kawal, however, by virtue of the suffrages of the eleven out of the twelve Batins, and by the support of the Rajah de Rajah, is generally considered the legitimate chief. In Johole the Batins have a similar influence in the election of the Panghulu."

It appears certain, that in former times the Batins exercised such an influence in the elections of the Malay chief; but we must say that they have at the present time lost a great part of it; for in Johole, Rumbau, and several other places, they are so few in number that such a fact would be impossible, and the contempt which the Malays have for them, as well as their own natural disposition to tranquillity and peace, scarcely permit us to believe that such is the case now even for Sungei Ujong, where they are the most numerous.

TRADITIONS.

The traditions entertained by the Jakuns, though frequently ridiculous, and relating impossible and fictitious facts, are not always to be rejected, because sometimes they contain more or less truth; or

may otherwise lead to the discovery of it. I will relate here a few of these traditions, which if of no other utility, will assist in making known the interesting race I am now describing.

The following is a tradition entertained by a part of the Jakuns of Sungei Ujong and Rumbau and related by some of their Batins.

" In the beginning of the world, a white Unka and a white Siamang dwelt on a lofty mountain: they cohabited and had four children, who descended from the mountain into the plain, and became mankind. From them sprang four tribes. In after times the heads of these tribes, Nenek Tukol, and Nenek Landasson, Nenek Jelandong, and Nenek Karoh, were invested by an ancient king of Johore, with the honorary titles of To Batin Kakanda Unka, To Batin Saribu Jaya, To Batin Johon Lelah Perkasseh, and To Batin Karah.

The first founded the state of Calang, and possessed the Canoe Sampan Ballang ; the second ascended the Samowa, or Lingee river, and founded Sungei Ujong ; the third proceeded to the hill of Lantei kulit, and founded the state of Johole ; and the fourth to Ulu Pahang.*"

The following is another tradition entertained by several tribes, and delivered to me by a Batin of Johole.

Formerly, God created in heaven, a man and a woman. They were Batins, (that is a king and a queen,) of course, without kingdom or subjects. History says not how long a time this couple inhabited heaven ; but only that one day, they descended on earth, and were found near the river of Johore, on the southern part of the Peninsula.† There, this celestial Batin and his consort begat a numerous family, who peopled all the Peninsula : Those of them who embraced Islamism are called now Malays ; and the others who remained more faithful to the manners and customs of their ancestors retained the name of Jakuns.

It is not necessary to pay great attention to perceive the analogy between this tradition, and the true history of the creation of mankind, as it is reported in the holy scriptures ; or rather, would it

* Newbold vol. II. p. 376.

† Compare the Johore tradition, *ante* vol. I. p. 278, 280. ED.

not be the same history deformed in several circumstances, but correct, and easily recognized in several others?

There is a tradition on the origin of some tribes of Jakuns, called Orang Laut, (men of the sea,) because they live ordinarily in boats upon the sea, and on the sea shore. It is related in the following way.*

"Datta Klambu, a man of power in former days employed a number of Jakuns in the building of a palace. He had an only daughter, who, once upon a time observing the primitive costume of some of her father's workmen, was seized with an uncontrollable fit of merriment. Whereupon, the irritated Jakuns commenced the incantation "chinderwye," and pursued their way to the forest, followed by the spell bound princess. Dattu Klambu despatched messengers to bring back his daughter, but she refused to return, and eventually became the spouse of one of the Jakun chiefs. Dattu Klambu, on receiving intelligence of this occurence, dissembled his resentment, and invited the whole tribe to a sumptuous entertainment, on pretence of celebrating the nuptials. In the midst nf the feast he fired the palace, in which the revels were carried on, and the whole of the Jakuns except a man and a woman, perished in the flames. These two Jakuns fled to the sea-shore, and from them sprang the Orang Laut, who, not daring to return into the interior, have ever since confined themselves to the coasts and islets."

This tradition related by Jakuns is entirely different from another entertained by the Orang Laut themselves on the same subject, for, they say, that their first parents were a white alligator and a porpoise.†

RECIPROCAL FEELING OF JAKUNS AND MALAYS.‡

The Jakuns hate the Malays, and the Malays despise the Jakuns. There is a natural and uncontrollable antipathy between these two people; but they stand in need of each other, and their mutual intercourse is necessary; the Jakuns launch out into incessant com-

* Newbold vol. II. p. 411. † *Ib.* p. 422.
‡ See *ante* vol. I. p. 285, 328.*

plaints against the Malays, as being bad people, cruel, murderers; and, what is no less criminal before them, thieves, pilferers, and liers. Some made to me the sensible remark, that the numerous sambayangs, or prayers of the Malays, could not be of any use for them so long as they continued addicted to so many vices; but they take great care before they thus express themselves to look about, for they know that if any Malay should chance to overhear them, they would not remain long uninjured. The Jakuns thus hate and abhor the Malays, but they fear them; and what makes their position more irksome is the necessity they are in of being obliged to have commerce with them: the dammar, and several other products they find in the forest cannot be disposed of excepting by the hands of the Malays; which establishes a daily intercourse between them. But it is really surprising that these communications are always in good terms, and though the Jakuns are rude and wild they yet know how to give to the Malays *de l'eau benite de court*, and keep habitually great harmony and peace in their relations. But if the Jakuns hate and fear the Malays, the Malays in return despise and fear extremely the Jakuns. The Malays consider the Jakuns as Cafirs, that it as infidels, and in that quality to be despised, and as being in a rank only a little higher than animals; but on the other hand, the Malays are superstitious in the extreme. For Malays, every thing they do not understand is a mystery; everything not common must be endowed with extraordinary virtue; and consequently, for a Malay, a Jakun is a supernatural being, endowed with a supernatural power, and with an unlimited knowledge in the secrets of nature; he must be skilled in divination, sorcery and fascination, and able to do either evil or good according to his pleasure; his blessing will be followed by the most fortunate success, and his curse by the most dreadful cnnsequences. When he hates some person, he turns himself towards the house, strikes two sticks, one upon the other, and, whatever may be the distance, his enemy will fall sick, and even die, if he persevere in that exercise for a few days. Besides to a Malay the Jakun is a man who, by his nature, must necessarily know all the properties of every plant, and consequenly must be a

clever physician, which explains the impatience of Malays when sick, to obtain their assistance, or at least get some medicinal plants from them; and these they must obtain, on any terms, because it is necessary for them, and must preserve their life. It is not necessary that such a physician should go to the house of the sick man; as he knows everything, he will give in his own house the proper remedies to cure the sickness. He is gifted with the power of charming the wild beasts, even the most ferocious. Such are the effects of Malay silliness and stupidity, joined with the most absurd superstition; and the reason why, though they despise the Jakuns, they fear them, and refrain from ill treating them in many circumstances.*

COMPARISON BETWEEN JAKUNS AND MALAYS.

When we compare those two people in whom many points seem to assign a common extraction, we cannot prevent ourselves from having a feeling of astonishment on perceiving so remarkable a difference. I have already said what is the dissimilitude, if considered in their physical appearence; but I can say that it is very little when compared with that which exists in their manners, customs, and with the moral qualities of these two races.

The Malays are much inclined to robbery and cheating, and they generally follow this inclination.† No man can entrust them with anything. Though I paid the most particular attention to my trifling and simple baggage, every time that I have travelled in the interior, and had always a servant watching, several things were stolen, and some times I caught the rogue in the fact: and what moreover shows a people accustomed to such a vice, is that after having been caught in the fact, they are not at all disconcerted, and with an imperturable *sang froid* deny the circumstances. To lie for a Malay is nothing, injustice and perjury are but small peccadilloes, which will be forgiven by God as soon as forgotten from their memory, which

* I must remark, that I do not here mean to speak of many of the Malays who live within the limits of the English settlement; many of these, on account of their more frequent communications with Europeans, are more civilized, and consequently less superstitious.

† I speak more particularly of the Malays living in the interior, there is a great difference between them and those who are in contact with Europeans.

happens presently. In order to plunder strangers who journey amongst them they must know in detail all the parts which compose his property; this is the reason of so many questions, more or less importunate, which they put to the traveller, upon his state, his fortune, his position; an the objects contained in his baggage, which must be unfolded and examined in detail and which they as surely ask for as a gift; then the traveller must consider himself as warned, and direct his particular attention to the things which were asked for, as they are in danger of disappearing.

I recollect that when journeying in Johole, every time I reached a campong of Jakuns, and entered any house, where I intended to stop, at once a woman of the family took a basket, went away, and a few minutes after, entered again with some klades or other vegetable, which were cooked and presented to me about half an hour after my arrival. When the next day I offered to them some small articles, as a return, they received them with some appearence of shame; so much so, that I was obliged to show them, that this was not a present, but a debt; and that I was only doing according to the custom of my native country, where a traveller must always give some thing to the owner of the house where he has slept. On the contrary on my entering any Malay home, I perceived that the chief of the family, in the persuasion that this was a lucky wind-fall not to be lost, began, at once, by taking every means to speculate upon me; hence the exaggerated difficulties to continue the journey, which are made to appear as impossible, for want of coolies, of guides, &c.— which signifies, "*If you do not give me some good present, you shall not pass farther.*" The traveller may give as much as may be in his power, yet this will never be sufficient. The actions of Malays generally show low sentiments, and a sordid feeling; but the Jakuns are naturally proud and generous.

These two people, so different in many points, are notwithstanding similar in some respects: both are ignorant, and consequently superstitious. In these two points they resemble each other, with this difference that the Malays are ignorant and pretend to be the most enlightened people and refuse to hear any body. The Jakuns are

ignorant, but aware of their ignorance; though they are proud and independent, yet they think that others know better than themselves and thus bear easily to be taught. With respect to the latter though these two people are superstitious, certainly the Malays are more so than the Jakuns; and I further observed, that those of the Jakuns who have less correspondence with the Malays, are also the less superstitious.

From whence then comes so remarkable a difference between two peoples, who have inhabited the same country for so many centuries, and who appear to have about the same origin? This question presented itself many times to my mind, during my several journeys in the interior of the Peninsula; and to it I have not yet found a satisfactory answer. I will notwithstanding offer here, a few expressions, which may present more or less probability. Would not the plundering and bloody way of propagating the Koran, by which the Malays have been made Mohammedans,* be the first principle of their inclination to plundering and bloody actions; as it is natural in human nature to feel less repugnance for any thing which already has become consecrated by religious views. It is remarkable that about the same inclination is found in almost all the Mahammedan nations. Every one knows that before France took Algiers, the whole of the Algerine states were an empire of pirates. In the same manner before the English sway had established security in this part of the

* The Malays were not originally coerced into Islamism, nor have instances of violent conversion, such as the recent one of many of the Battas by the Padris in Sumatra, been frequent in later times. "The Arabs and other Mahomedan missionaries conciliated the natives of the country,—acquired their language,—followed their manners,—intermarried with them,—and, melting into the mass of the people, did not, on the one hand, give rise to a privileged race, nor on the other to a degraded cast. Their superiority of intelligence and civilization was employed only for the instruction and conversion of a people, the current of whose religious opinions was ready to be directed into any channel into which it was skilfully diverted. They were merchants as well as the Europeans, but never dreamt of having recourse to the iniquitous measure of plundering *the people* of the produce of their soil and industry. This was the cause which led to the success of the Mahomedans, and it was naturally the very opposite course which led to the defeat of the Christians. The Europeans in the Indian Archipelago have been just what the Turks have been in Europe, and the consequences of the policy pursued by both may fairly be quoted as parallel cases." Crawfurds History of the Indian Archipelago vol II. p. 275. ED.

world, the Malays too were a nation of murderers and pirates.* It is certain also that Islamism leads its followers into ignorance, and consequently into superstition, which is its usual result. It is ascertained by travellers, that countries inhabited by Mohammedans, are those where exists the profoundest ignorance. And every one is aware of the historical fact of the destruction of the famous Library of Alexandria, under the pretext that the Koran was the only book necessary, all others being useless; hence was destroyed this sacred sanctuary of doctrine, and extinguished one of the brightest scientific luminaries, which has ever enlightened any part of the world.

SYMPATHY AND CONFIDENCE TOWARDS EUROPEANS.

If the Jakuns hate the Malays, and fear them, it is certainly not an effect of egotism, and of a natural timidity; for they do not so towards

* "From the period at which Europeans first visited these islands, their civil history may be summed up in few words; it is included in that of their commerce. The extensive trade of these islands had long collected at certain natural and advantageous emporia; of these Bantam, Achau, Malacca, and Macasser, were the principal. The valour of Portugal broke the power of the native states, and left them exposed to the more selfish policy of their successors. The Dutch had no sooner established their capital at Batavia, than, not satisfied with transferring to it the emporium of Bantam, they conceived the idea of making it the sole and only depôt of the commerce of the Archipelago. Had this object been combined with a liberal policy, and had the local circumstances of Batavia not obstructed it, the effect might have been different, and, instead of the ruin and desolation which ensued throughout a large portion of these islands, they might have advanced in civilization, while they contributed to raise the prosperity, and support the ascendancy of the Dutch metropolis. But when we advert to the greedy policy which swallowed up the resources of this extensive Archipelago in a narrow and rigid monopoly; and that, instead of leaving trade to accumulate, as it had previously done at the natural emporia, it was forced, by means of arbitrary and restrictive regulations, into one which, independent of other disadvantages, soon proved the grave of the majority of those who were obliged to resort to it, we shall find the cause which made it as ruinous to the Dutch as to the people. By attempting too much, they lost what, under other circumstances, might have been turned to advantage, and the native states, deprived of their fair share of commerce, abandoned all attempts, and sunk into the comparative insignificance in which they were found at the period when our traders began to navigate those seas from Madras and Bengal. *The destruction of the native trade of the Archipelago by this withering policy may be considered as the origin of many of the evils, and of all the piracies of which we now complain.* A maritime and commercial people, suddenly deprived of all honest employment, or the means of respectable subsistence, either sunk into apathy and indolence, or expended their natural energies in piratical attempts to recover, by force and plunder, what they had been deprived of by policy and fraud."—Sir T. S. Raffles, Introduction to Leyden's Malay annals, p. vii. ED.

other nations: they dislike not the Chinese; and they have a remarkable sympathy for Europeans, and place unlimited trust in them even after a single interview. The reason is that generally Europeans show in their conversation a security and franckness, which by its great contrast with the deceitfulness of the Malays, catches at once the hearts of this people of children. They love the European and attach themselves to him, as soon as they know him, and the slightest good office received from him, is the source of the most unbounded gratitude: though this fact was related to me by several persons, I scarcely believed it, until I was myself witness of it. Among many examples which confirm what I now state, I will relate only one, which took place in a journey I undertook in the Menangkabau states in order to visit the Jakuns who live there; I was accompanied by the Revd. Mr. Borie.

After having visited the states of Johole and Rumbau, we reached that of Sungie Ujong on the sixteenth July, about 12 o'clock. We spent the afternoon in the village near the river where there are more than one hundred Malay and Chinese houses, and a Market. We were informed that the chief of the state was living at Pantoy, a place about eight or nine miles further; and was then celebrating the rites of a triple marriage. Three persons of the royal blood, two children of the chief and another of his relations, were contracting marriage with three persons of the first families amongst their nobility; we were informed too, that the wedding was one of the most solemn which could be found in a Malay country; fifty buffaloes were to be killed, and two thousand dollars to be expended in buying rice, fowls and other victuals; and also in gunpowder, which is much used in such solemnities; the feast was to last for two months and had already begun some few days. As it is not possible in a Malay country, to go to any place, without having first obtained permission from the chief, we took the next day our way to Pantoy in order to see him. We arrived at Pantoy at one o'clock in the afternoon, and at once we found ourselves surrounded by a number of kings, queens, princes, princesses, ministers of state, and officials of every rank, more than one hundred hadjis and Mohammedan priests, several

hundred Malays of every kind, and a similar number of Chinese workers in the tin mines. The Jakuns themselves had not been forgotten upon such an occasion; doubtless to prevent their resentment which could be followed by the most fatal consequences to the fate of the new spouses, and possibly also in order to render the feast more solemn, they had been invited; nearly one hundred Jakuns were already come, and a greater number more yet expected. We looked about us to find out in the middle of such a tumult some place where we could put up and place our things in security. Many houses had been built for the occasion, but were already filled with people. There was a quarter appropriated for the lodgement of the Malay priests and hadjis; another for the common Malays; and a third for the use of Chinese. We turned towards this last and were received by the Chinese with the usual urbanity and politeness characteristic of that nation. We entered the house of a Chinese, which we were immediately invited to do by the owner, a chief of the miners, who with kindness ceded to us the half of his lodging. After having cleaned our clothes a little, (which were the ordinary lay dress of a gentleman, the sonton being too cumbersome in such journey,) we asked that we might be allowed to see the king; we were then introduced into the palace around which we perceived many tents pitched in several places; and in the middle of a large place a high and rich tent, for the use of the new spouses, and communicating with the royal house by a long covering which was extended and established a shaded passage between these two appartments. The whole was adorned with standards of every kind, and with banderols of every colour, and presented a rural, but agreeable aspect. We were then introduced into a tent which appeared to be one of those applied to the service of the king. We had scarcely sat down, when the king himself entered accompanied by his brother; both took their places in a part of the tent adorned with draperies, forming a sort of throne. The king was dressed in a baju of red velvet, with gold embroidery, a silk sarong of a brown colour, and trousers about the same, with a silk handkerchief surrounding his head: his brother had a violet velvet baju, a blue sarong, and the rest of his dress much

about the same as the king's. After the usual forms of civility, we asked the necessary permission to visit several places, to see the Jakuns. The king received the request with kindness, and allowed us to go wherever we chose within the boundaries of his state; and after a few minutes of friendly conversation he got up, saying to us, come here, I will show you some Jakuns, and took the Revd. Mr. Borie by the hand. I followed them accompanied by the king's brother. We went to a place, where near one hundred persons, men, women, and children where huddled confusedly together, lying down under some old and miserable cart-house, separated from any other building; resembling the lepers of former times, who were bound to reside out side the gates of the cities. After having spent a few minutes in the visit we paid to these poor creatures, the king accompanied us to our lodging, and then returned back to the palace. The afternoon was spent in receiving the numerous visits of a good part of the wedding guests, who were desirous to see us, many of them having never before seen a European; for five or six hours, our house was full of people, and ourselves exposed to the curiosity of the public, as extraordinary beings, and bothered by a multitude of tedious questions. The Jakuns came according to their rank, and should, of course, all enter our house one after the other; several of them came repeatedly, and we understood, that they wished to communicate some secret to us; and in this we were not mistaken, for they came again in the evening, when they had watched that there were no Malays with us, and that we were alone. Then they opened themselves to us, showing us how unhappy they were in that place, and what bad treatment they experienced from the Malays, so that only a few days before several of them had been killed, and wounded by order of the Malay chief; they declared that they intended to escape over into the Company's territory, where they hoped to find more tranquillity and assistance; and asked us to take them with us. Two of them besought us to receive them as servants for ever, or rather as slaves, as they intended not to receive any pay. I was much moved by such a mark of confidence; for I knew well that by speaking so, they put their lives nto our hands; for the mention of their design would have undoubt-

edly been the cause of some fresh order for killing the first authors of this resolution, which would have been called a conspiracy. We gave a little advice to this poor people, who by their confidence showed, that they already considered us as their fathers; and we postponed the consideration of this affair to another day; as we intended shortly to return again.

As I have been, with a view to make known this occurence, led to speak of a Malay feast, I will continue to relate the circumstances which accompanied it, for the short time we remained in that place. We slept there two nights, and were kindly treated by the king, who, wishing to make us also partake of the feast, sent us every morning and evening, with his compliments, large pieces of buffaloes. The following was the daily order of the feast. At five o'clock A. M. the beginning of the day was announced by six cannons, which were powerfully repeated by the echo of the mountains on either side of the valley; a few instants after gun fire began Malayan music, which scarcely again ceased for a few moments during the whole of the day. About six or seven o'clock, a great quantity of rice and meat was distributed to all the guests. Then every one cooked and prepared his breakfast. The repast of the three bridegrooms and their brides was announced by a discharge of artillery. Twelve o'clock was the time when they took their drive; which was performed in the following way. A large place in the forest had been cut and cleared for the purpose; the spouses entered into a large chariot of the form of craft, brought on four massy wheels; this huge lump, instead of thills had two long ropes formed of twisted tree roots, to which more than a hundred persons yoked themselves, and pulled it about crying out with all the strength of their lungs; the procession was accompanied by several artillery men who fired incessantly. To such a noise and tumult, you can add two choirs of music, one executed by Malays, consisting of about a dozen gongs and as many flutes; the other by Chinese consisting of five or six gongs, a great number of cymbals, and many tamtams, all striking their instruments without tone or measure; and you will have an idea of the attractiveness of the party.

About three o'clock in the afternoon a fresh distributions of victuals again took place. At five o'clock, the new spouses took their bath and during that time, the Malay and Chinese musicians performed in the same way as during the drive. At six o'clock, more firing of cannon, and then commenced gambling, which was kept up nearly the whole night. Several choirs of vocal music accompanied by soft gongs alternately relieved each other, both day and night. On the morning following the second night after our arrival, we went to take leave of the king, and thank him for his kindness; and leaving the place behind us, we heard yet for a long time from afar the continued noise of the feast; and which had so powerfully stunned my ears, that the next day it was yet ringing in them.

THE CHINESE IN SINGAPORE.

NO. II.*

GENERAL SKETCH OF THE NUMBERS, TRIBES, AND AVOCATIONS OF THE CHINESE IN SINGAPORE.†

By SIAH U CHIN.

IN all Singapore, including the interior and the Town, there are, men and women, old and young, upwards of 40,000 Chinese.

There are 1st. Chinese from Hokein Province; these come from the departments of Chiang Chiu, Chuan Chiu and Eng Chun.

2nd. Malacca born Chinese.

3rd. Chinese from the department of Tio Chiu, which is under the jurisdiction of Canton Province.

4th. Chinese from Canton; these men are here commonly called Macao Chinese.

5th. The Khé Chinese, these are men who come from the two Provinces of Hokkien and Canton.

6th. Chinese from Hai-nam, which is also subject to the jurisdiction of Canton.

This is speaking of them collectively and in a general manner. There are also some few Chinese from other tribes, but of these it is difficult to form an estimate. Each individual tribe speaks the dialect of that tribe, and although there may be a slight difference in the dialect spoken by Chinese who belong to one and the same tribe in consequence of the remoteness of their respective districts, yet that difference, as it consists only in a few inflexions, cannot be properly called a different dialect. It is not however possible to enumerate all the different dialects spoken by the Chinese. I have not made it a matter of deep inquiry, touching the few residing in this settlement who belong to other tribes.

* See vol. I. p. 35.—"Annual Remittances by Chinese Immigrants in Singapore to their Families in China."

† This paper is composed of answers written by Siáh U Chín to queries by Dr. Oxley, to whom we are indebted for it. The original Chinese has been literally translated. The estimate of the numbers of each tribe engaged in different occupations we have procured from Siáh U Chin. ED.

The different trades and professions of the Chinese in Singapore, are School-masters, Writers, Cashiers, Shop-keepers, Apothecaries, Coffin-makers, Grocers, Gold-smiths, Silver-smiths, Tin-smiths, Blacksmiths, Dyers, Tailors, Barbers, Shoemakers, Basket-makers, Fishermen, Sawyers, Boat-builders, Cabinet-makers, Architects, Masons, Manufacturers of lime and bricks, Sailors, Ferrymen, Sago manufacturers, Distillers of Spirits, Cultivators of plantations of Gambier, Sugar, Siri, Pepper, and Nutmegs, Play actors, Sellers of cakes and fruit, Carriers of burdens, Fortune tellers, idle vagabonds who have no work and of whom there are not a few, beggars, and, nightly, there are those villains the thieves.

The above different trades and professions may be classed under four divisions.

1st. Those whose profession it is to teach come under the designation of Su, the literate.

2d. The cultivators of fields and gardens come under the denomination of Loñg or husbandmen.

3d. Those engaged in handicraft business belong to the class called Kong, mechanics, or manufacturers.

4th. Those who trade and open shops are designated Siang, merchants.

In my opinion, the greatest number of married men are to be found among the Malacca born Chinese ; next to them among the Hok-kien shop keepers, then the Tio-Chin, then the Khé, and lastly among the Macao Chinese; but Shop keepers chiefly can afford to marry. As for common laborers and coolies and those who have no fixed employment very few among them get married.

The Chinese who congregate here are a mixed mass from all parts ; the unmarried ones among them are very numerous, and the married ones very few. Though the number of the latter is very small still I cannot with any certainty state it; upon a general calculation I should suppose there were about 2000 married Chinese.

The number of Chinese who return annually to China is probably 3,000 ; of this number a large proportion come hither from other parts to procure a passage to China.

The labouring class of people that emigrate to this Settlement are mostly very poor. Originally they come with the intention of returning to their native land after a sojourn of 3 or 4 years, but out of 10 only 1 or 2 individuals are able to return after that time, and when they do retire they do not take with them much wealth; still as the remembrance of home is not obliterated from their minds they are willing to return even with a small fortune. There are some who return to China after 5 or 6 years, and others after 7, 8, and 10 years. The periods of return are various; there are a great number who remain here upwards of 10 and 20 years, and yet, unable to return, ultimately die and repose their ashes in this Settlement. Alas! for those who originally intended to return to their native country after 3 years, and yet after the lapse of more than 10 years have not been able to fulfil their wish; but what is the reason of it? It is because they become addicted to the prevailing vice of Opium smoking. After a continued residence here they learn the habit, which afterwards becomes fixed. Many of the Chinese labourers after having earned a little money, waste it upon opium or expend it in gambling. After a series of years they save nothing, and every day it becomes more and more difficult for them to return to their country. With empty purses and empty hands they may manage pretty well without gambling, but to go without opium would be to them certain death. When these opium smokers are reduced to straits from want of money they resort to schemes of plunder and robbery. They do not fear being immured in prison, nor do they dread being transported to Bombay. It is not however that they do not actually dread the one nor fear the other, but the hope of impunity emboldens them; they think that if they become robbers, it is not so very sure they will be apprehended, or if they are apprehended and brought before the Magistrate, they hope by clever subterfuges to escape punishment. Should they however not escape punishment but be confined in prison, or transported to Bombay and there die, that would be a death which they would far prefer to the wretched death from deprivation of opium. It is on this account that robberies have multiplied to such an extent, and they may be

uniformly traced to opium, the instigating cause of all; and the laborers of the interior who consume their days in fatiguing toil, and constant exposure to destruction from the numerous tigers, do thus brave death only that they may obtain the means of indulging themselves in the luxury of opium smoking. Incalculably great is the bane of opium. It urges the robber to death. It hurries the labourer to destruction by the jaws of tigers. Grievous to the last degree is this fact. Philanthropists of the age does not this rend your hearts, and affect your eyes? Does it not lead you to lament their stupidity, and to contrive means by which you may rescue them?

The number of men that arrive in the Junks annually amounts to about 10,000.* Some of these, after remaining in Singapore a few days or months proceed to Rhio, Penang, Padang, Acheen, Java, Minto, Pahang, Malacca and other parts in the Archipelago.

In the gambier and pepper plantations there are generally 9 or 10 men employed, 12 and 13 men are considered a full complement. I have never heard of any plantation having as many as 20 men upon it.

* The Editor of the Singapore Free Press has obliged us with the following table shewing the number of Chinese Passengers who arrived in Singapore by the undermentioned Junks from China, from the 28th December 1847 up to the end of April 1848.

By 17	Junks	from	Macao,..	3,396	men.
„ 6	„	„	Chong lim,	1,446	„
„ 10	„	„	Canton,	1,426	„
„ 3	„	„	Kong moon,	637	„
„ 7	„	„	Amoy, ..	631	„
„ 2	„	„	Swathow,	580	„
„ 2	„	„	Hye Kow,	95	„
„ 2	„	„	Chawan,	65	„
„ 1	„	„	Chan Chew,	60	„
„ 1	„	„	Jeepoon,	48	„
„ 2	„	„	Shanghai,	43	„
„ 1	„	„	Hokeean,	32	„
„ 1	„	„	Tew Chew,	250	„
55	Junks			8,709	„
23	„	from	Hy lam,	320	„
30	„	„	Anam,..	116	„
108	Junks,		.. ..	9,145	„
By 11	Square rigged		Vossels,	1,330	„
			Grand Total,..	10,475	men.—Ed.

Sometimes when the relations of Chinese labourers arrive from China, if they have no home to go to in Town they immediately proceed to their relations in the jungle, and take up their abode with them for a short time; then there may be a collection of as many as 20, but these temporary sojourners I do not include in my estimate. The plantations that have most men employed on them are those of persons who possess large capitals, and who are engaged in the cultivation of nutmegs, also the sugar plantations of the Americans.

It is very difficult to ascertain the proportion of healthy and sick persons in the interior; it is however supposed that the majority are healthy.

In the town it is difficult to find out how many die; it is still more difficult to ascertain the number of those who die in the interior, as the localities of the different groups are separated by distance and divided by rivers. Not knowing, were I to state any thing on the subject it would be tantamount to falsehood. However as the head of the Police has issued orders that the different tribes of Chinese shall give information at the Police office of the diseases of their countrymen who die, in order that the same may be registered in the Records; you will be able hereafter to obtain the desired information by applying to that office.

Those who plant vegetables and siri do not venture to work at midday, for if they do so they get afflicted with dropsy. The effluvia of decomposed substances in the marsh Payo lands inhaled by the people causes this. Although this disease may be avoided still it is of frequent occurrence. Those who plant gambier, in consequence of their having constantly to split wood, get their legs and feet hurt with splinters, the broken skin being disregarded, large ulcers are formed.

The Chinese in the jungle having daily to work very hard, are much oppressed by the heat in hot weather and affected with colds in cold weather. Would it not be considered a great virtue in those benevolent people who may pity their sufferings to provide them with medicines?

They have three meals daily, which consist of rice fish, and

different kinds of vegetables. Those who have a little money add to these things, arrack, fowls, ducks, and pork; they also eat siri and smoke tobacco just as the Chinese in Town do. There are also a good number of opium smokers; when they have once acquired the habit they cannot break it off and they consume their money upon the drug.

They wear short jackets and short trowsers made mostly of coarse Nankeen, and unbleached stuff; they have a bag tied round their loins in which they keep their money and other little things; they go bare footed and wear bamboo hats on their heads to protect them from the sun; some wear feltcaps, which, though very thick, they say are not uncomfortably warm; this is their common dress, but on extraordinary occasions they wear shoes, white jackets and silk trowsers, and when they come to Town they have umbrellas to screen them from the sun, and in every particular resemble the Chinese in Town.

The houses in which they live have wooden pillars; the walls are formed of attap leaves, they do not cover the roof with tiles, but with attaps. This is the prevailing description of houses. They resemble in a great measure the houses of the Malays, but there is this difference, that the houses of the Malays are mostly raised above the ground, whereas those of the Chinese are low on the surface; the walls of the houses are formed, some of the bark of trees, some of kadjang, and others of dried grass; some cover their roofs also with dried grass; those who are in pretty good circumstances use thin planks for their walls, but there are very few such. Except the temples, none of the Chinese houses are covered with tiles.

Their wages vary. Those who are skilled in planting siri receive a monthly pay of 4 dollars, the next get 3 and 2 dollars. The amount of wages is determined by the quality of work whether it is good or inferior. The amount of wages of labourers in the jungle differs. Generally speaking, each labourer gets about 3 dollars per month, the wages of those who cut the Gambier leaves and of those who boil the gambier are somewhat more, but neither is their rate of wages fixed, they are paid more or less in proportion as the price of

gambier rises or falls. If a picul of gambier realizes $1\frac{1}{2}$ dollars the monthly pay will be about 3 dollars. If a picul realizes 2 dollars the price of their labours will amount to about 4 dollars. There is no fixed rule, the workmen who clean the gambier plantation, and those who do different kinds of lighter work, always receive a dollar less than those who cut and boil the gambier. The above is, generally speaking, the rate of wages of labourers in the interior.

The numbers in each of the tribes mentioned in the preceding paper may be estimated as follows:

HOKIEN (including Ang Chun people.)	
Shopkeepers, such as those who sell rice and other articles by retail	1,400
Id. sellers of cloth by retail.	200
Id. sellers of crockery ..	250
Gambier and Pepper dealers	100
Petty traders	750
Sago manufacturers	500
Venders in the public market	300
Boatmen	700
Watermen	250
Porters	800
Fishermen	200
Lime Burners	100
Coolies employed in assisting masons	700
Masons	100
Itenerant venders	100
Agriculturists	2,000
Revenue peons and arrack and chandu preparers ..	70
Boatmen employed in bringing earth & sand for building and other business of the kind	230
Unemployed	250
	9,000

TE CHU.	
Shopkeepers, such as those who sell rice and other articles by retail. Id. sellers of cloth by retail. ..	1,900
Gambier and Pepper dealers	200
Id. planters	10,000
Venders in the public markets, ...	300
Boatmen	300
Fishermen	600
Coolies employed in assisting masons	100
Itenerant venders	300
Agriculturists	2,000
Unemployed	600
Stone cutters &c. .. .	150
Shopkeepers in the country.	2,000
Seamen employed in Sampan Pukats	360
Charcoal Burners.	140
Barbers	50
	19,000

MALACCA CHINESE (descendants of Hokien immigrants)	
Merchants and shopkeepers and their people	300
Cash keepers and others employed by Europeans . ..	100
Householders employed variously, ...	300
Petty traders, ...	200
Agriculturists,.	100
	1,000

MACAO.	
Shopkeepers such as those who sell rice and other arcles by retail. Ib. sellers of cloth by retail, ...	350
Employed by Europeans and Chinese as house servants, coolies, ...	500
Gambier and pepper planters.	400
Tailors and Shoemakers, ..	400
Ship and boat builders, ..	400
Cabinet makers & Carpenters	1,000
House Carpenters, ...	300
Wood cutters and sawyers,..	1,000
Bakers,.	200
Lime Burners, ...	250
Coolies employed in assisting masons, ...	500
Barbers, ...	200
Brick makers	500
	6,000

KEH.	
Tailors and shoemakers . ..	400
Makers of wooden boxes ..	300
Blacksmiths	500
Goldsmiths	100
Barbers	100
Sawyers and wood cutters ..	800
House builders	1,000
Petty traders	300
Id. in the country.	300
Persons employed in miscellaneous work..	200
	4,000

HAILAM.	
Shop servants, ...	100
Servants employed in the country, ...	600
	700

VISIT TO THE TANKOEBAN PRAHOE IN JAVA,

After the eruption of the 27th. May, 1846.

By Dr. Bleeker.*

Since 1829, no unusual commotion had been perceptible in the crater of the Tankoeban Prahoe. On the 27th of May, however, another eruption consisting of ashes and mud from the Kawa Ratoe took place, accompanied, according to the testimony of the inhabitants of the districts Segala Herang and Batoe Sirap, with slight earthquakes. This eruption continued longer than a night, and thus the rising of the vapour from the Kawa Ratoe or principal crater, most have been more remarkable than before this recent explosion. When at Tengeragong in the district of Segala Herang we perceived from the country house of Mr. Hofland those vapours rising, the intention previously formed at Wanayassa of visiting the crater was immediately determined on. On Wednesday the 10th of June, exactly a fortnight after the eruption, Dr. Bosch, chief physician, Mr. Hofland and the undersigned commenced the journey to the mountain, taking the road by Panaroebon and Tjatter. From Tjatter, a " kampong" on the north declivity of the Tankoeban Prahoe with 880 inhabitants and a great coffee establishment, 3600' above the sea, we proceeded against a rather steep mountain side through the middle of extended coffee plantations which encircle the mountain for above 4000'. New clearances higher up the mountain have been made for the cultivation of the coffee plant. Having passed these we entered the primeval forest of the regio montana. Of the low kinds of vegetation nothing is perceptible as the interval between Tengarong (1900' above the level of the sea) and the borders of the coffee plantations is cultivated with rice, tea and coffee.

Nothing probably demonstrates more the majesty of nature than a primeval forest of Java's " regio montana." As soon as the agricultural borders of this part of the Tankoeban Prahoe are past, you

* This article has been translated from the Tijdschrift voor Neerlands Indie by Dr. Minter of H. M. Steam Ship " *Medea*", to whom we return our best thanks for his kindness. Ed.

find yourself amongst the vertical giant stems of a wood which, however different in kind, causes no more interest than if, like the "Pines of the North" they consisted of one species only.

The trees are far enough apart to see at one glance a thousand of them, mostly a hundred feet in height and from 2 to 5 feet in diameter rising perpendicularly to 40 or 60 feet before they spread out their branches and form their crown of leaves, through which daylight much weakened finds its way with difficulty,—it involuntarily reminds one of an immeasurable temple with its green roof supported on a thousand pillars. This first impression is much augmented by the deathlike silence and the complete immobility of all surrounding objects. Not a stem shakes or moves, not a leaf rustles. The forest appears conscious of the volcano beneath at whose expense it has derived its majesty; it seems to know the danger which threatens it, below from the destructive hand of man, above from the awful craters which appear ready to pour over it their deadly vapours or hissing mud. It appears in deadly silence to await its fate. Notwithstanding this apparent death not a spot can be perceived not teeming with life, the rich moist soil of the trodden narrow footpath excepted. The bottom is covered with moss but even this is seldom visible through the ferns stretching their foliage above and below between the stems of the trees to several feet above the surface, and yet are only low grass compared to the gigantic stems whose crowns shadow them. Numerous amongst these Filices are the magnificent tree ferns the Pakoe Tiang of the Soedanese, which first show their star formed leafy crown above the lower vegetation and remind one of the palm and shore foliage. Here and there between them blossom the fine scented Gandapoera wangie, odoriferous haurineen and higher up the elegant Pandan which, with many other plants, on closer inspection enliven what at first appeared a deadly scene. But between this vegetation on the ground and the high crowned arches of the proud trees a third world of vegetation flourishes, that of the parasites and pseudo parasites. The ground was too confined to nourish and spread to view such riches. A forest in the tropics is as it were one of nature's capital towns where the nume-

rously planted individuals to obtain room must inhabit different stories. Mountain declivities and ravines are amongst such; increasing the square surface within a narrow compass: but these are not sufficient. Every spot has it separate stories, the bottom feeds alike the humble and more proud and towering vegetation, but each stem, be it of larger or smaller tree, each branch, however high it may wave above the trodden ground, is conquered by a host of plants who for their growth and sustenance thus obtain the juices which the ground does not, nor the moist mountain atmosphere, furnish in sufficient quantity. Hence every tree, from the root to the highest branch, is seen clothed with moss. Melastomaceæ and Orchideæ show their gaudy and delicate flowers,—greatleaved Zycopodiacea here and there surround the stems, and the beautiful Loranthus flowers embroider at intervals this tree carpet with their bright colours.

But how the scene changes, as we approach the principle crater! From whence this change from green to grey, that vanishing of all bloom and flower no longer to be found along the stout tree roots covered with moss? And if we climb a hundred steps higher—whence that grey powder covering the stems, branches and leaves with a leaden hue—from whence that withering of foliage and stem, that scorching of the more humble vegetation? From whence this separation of life and death? Ascending we arrive at the cause which spread death and destruction there, where a few days since life was vigorous. The scene becomes more and more terrific as we approach the Kawa Ratoe, which from its unfathomable abyss has thrown an astonishing mass of mud and ashes on the trembling wood which shared the earthquake. Thousands and thousands of trees lie blistered and decapitated along the mountains side or in the deep ravines, buried partly under mud, partly under ashes, some rising out of it, all however under a direction from West to East prostrated by the destructive power. Hurricane and fire appear to have rivalled each other in the work of annihilation. Whatever is not thrown down or broken is bent like reed, from a shrub to the larger trees. Beneath us by the cultivated border was spring, nearer autumn, and higher

winter. Yet not so, the simile of a European winter by no means conveys the desolation which the neighbourhood of the Kawa Ratoe, with its for the greater part buried mountain wood, at present depicts. So dead are not the European forests when the frost brings them their winters rest. That is only sleep, at most so under the protecting mantle of snow;—here it is *death* through suffocation, scorching, crushing. The rude autumnal blasts of the north may bend, break or root out the woody stems, but where can there be seen the mountain tops swept completely bare and the largest trees bent like reeds? After having struggled between and over the felled wood and climbed the barren edges of the crater we found ourselves on the Kawa Ratoe.

We reached the brink of the crater on the E. N. E. side and as its walls here are very perpendicular, one of the most striking views in the volcano, at a depth of 800 in the bottom of which the liquid mud still heaves, may from this spot be obtained.

The Tankoeban Prahoe is one of the active volcanoes of Java which has been most visited by Europeans. Horsfield paid a visit to the principal crater in 1804 and gave a description of it.*

Blume and P. P. Roorda van Eysinga ascended the mountain in 1821, of which the last named professor has published an account.†

F. G. Valck has described a trip to this mountain which he undertook in 1823 in company with J. W. Stanffenbeil and G. Davidson.‡

De Wilde§ has given a drawing of the Kawa Ratoe with a rather romantic description.

P. van Oort and S. Muller visited the Kawa Ratoe, the Kawa Opas and the Kawa Badak in 1832 and gave an elaborate description of it.‖ Three pictures drawn by van Oort and very recently publish-

* On the mineralogy of Java. Transact. of Batav. Societ. vol, vni 2d. print. p. 153–158.

† Indie ter bevordering der Kennis van Nederl. Oosterche bisittingen 3de. boek 2d. deel p. 400–403.

‡ Onnteekening van eene reis naar den brondenden berg Tankoeban Prahu, gelegen in het district Segala Herans, Residentie Krawang.—Tijdschrift v. Neerl. Indie Jaarg. v. 1843 Dl. 1. 174–184.

§ De Preanger Regentschappen.

‖ Aanteekeningen gehouden op eene reis over een gedeelte van het eiland Java Verh. v. h. Bat. Gen. V. K. en W. Del. xvi. p. 131.

ed * are now before me and represent 1st. a view of the Tankoeban Prahoe and the southernmost portion of the Boerangrang, 2d. the Kawa Ratoe from the N. E., and 3rd. the Kawa Opas taken from the N. E. side. Junghuhn gave a topographical relation, as it is said, from a visit to the mountain in 1837 in company with Fritze and Nagel.† It would be superfluous to give another description of the different craters, as to their form, situation and extent. I found them after the recent eruption generally as Junghuhn has described the Kawa Ratoe and the Kawoe Opas and Van Oort and S. Muller the Kawa Badak. But have all the conspicuous eminences and their relative positions remained the same, and the Kawa Opas and Badak itself undergone no change?—the Kawa Ratoe still bears the evident marks of the eruption which a few days since filled the inhabitants at its feet to the eastward with fear and terror. Nothing more is perceptible of those land slips which formerly along the side of the crater afforded the traveller so many resting places in his descent,—nothing of those through sulphurous vapours changed into whitish masses or porous ridges as stated by Junghuhn along the sides of the crater,—nothing of that white, grey or yellow colour of the volcano,—nothing of the clear grey or yellow ashes on the bottom,—and nothing more of those Thibandia bushes which before the last eruption at intervals decorated the mouth of the crater:—at present a universal greyish blue colour prevails from the bottom to the highest ridge, the sides of the crater are at present entirely covered with mud and ashes which have not left a single stone exposed to the eye and nevertheless scorched and covered completely the sparing vegetation. The crater at present is a deep funnel with slippery sides declining with an inaccessible declivity to the volcanic pit, which is still filled with mud bubbling and sending up its hissing vapour as much higher above the craters top as that is distant from the bottom. It appears that dur-

* Verhandeling over de natuelyke geschiedenris der. Nederl. Overz. besittingen hand & Volkr plaat 75, 76 & 77.

† Bydiagen tot de geshiedenis der Vulcanen. IO. Tankoebang Praw. Tyds. voor neerl. India, Jaarg, v. 1834 pag. 185-202 en Topographische und naturwissenschftliche Reisen durch Java, 1845, pag, 188-194.

ing the late eruption the mud filled a great portion of the funnel and that it was moved in a direction from west to east. The comb between the Kawa Ratoe and the Kawa Opas situated to the westward of it has suffered little or nothing and is still covered with its Thibandien bushes, excepting by the side towards the Kawa Ratoe. On the southern and western side also the contents of the crater have not overflowed its rim.

The mass of mud has poured itself over the east rim of the crater and corresponding side of the mountain and thrown down every thing in its course. It is evident that this eruption of mud was also accompanied by one of ashes moved in the same direction and this explains how the wood situated lower down and left standing was found covered with them.

We attempted to descend on the south side of the crater where alone it was practicable. We had however scarcely proceeded fifty steps when we were compelled to relinquish our intention both because the mud and ashes were too loose and brought us in danger of being precipitated with them into the crater, and because the N. E. wind set the dreadful clouds of vapour directly upon us by which we ran great risk of being suffocated. Prudent through the misfortune of others, as three days before our ascent five men from the Bandongsche district perished near this spot from this steam, we did not venture further. Notwithstanding we only descended so short a distance in the crater, the remarkable difference of the temperature within it and on its eastern border did not escape us. At ½ past 2. P. M. the weather being foggy Fahrenheits Ther. stood at 64° on the east side of the top, and ¼ of an hour later, the weather remaining the same, within the crater not more than 50 steps on the south side, at 79°, giving a difference of 15°; if the heat may be measured by this comparison it is evident that, setting aside the dangers mentioned, it was at the time of our visit not practicable to reach the bottom. Having collected a quantity of ashes, mud and a few specimens of fine grained trachyte and lava, dug up out of the former we returned to Tjatter.* We returned over another mountain ridge

* These specimens were presented to the museum of geology of the

lying in an easterly direction to that which we before ascended, and is parted by a deep ravine from it. Here the work of destruction was greater and more extensive than at the other place and stretched out to the neighbourhood of the Kawa Badak described by Valek, Van Oort and Muller. Although the inhabitants assured us that the Kawa Badak had become more active since the last eruption of the Kawa Ratoe, we could trace no appearances differing from those described by Van Oort and Muller, and indeed the general and special appearances of this crater or rather Solfatara had undergone no particular change. The temperature however of the water bubbling up in several places was from 192° to 195° Fah. and the temperature of the vapour issuing through numerous holes from a completely undermined bottom at those apertures from 210° to 218° Fahr.

Before the close of the evening we had returned to Tjatter.

According to the published records the eruptions of the first days of April 1829 must have been very heavy, and burning lava with large stones as well as ashes were projected. That lava and those stones must then as at present have been ejected over the eastern side of the mountain.*

Whatever may be true of those reports, this is certain, that the eruption of 1829 bore no comparison with the present one; as the age of the trees thrown down dates long before 1829, and they must therefore during that commotion have remained standing.

BLEEKER

Poerwarkarta, June 13th. 1846.

Society of Science and Art at Batavia. The mud and ashes are being analysed by the skilful Mr. Maier, the results of which will be published.

* Javasche courant of the 5th. May 1829 and the report of van Oort and Muller. l. 6. p. 154.

MISCELLANEOUS NOTICES &c.

By the last Steamer from Batavia we received the 1st. number of a new series of the "Tijdschrift voor Nederlandsch Indië" edited by Dr. W. R. van Hoëvell. It is more properly an entirely new work, possessing a wider range of subjects, and promising to treat them in a larger aim and spirit. The confidence of the Government in the able and estimable editor, appears to have induced them to relax the bonds in which their jealousy of a free literature has hitherto held the press in Java, and it is not too little to say, that, with this new series of the Tijdschrift, Dr. Hoëvell opens a new and brighter era in the progress of Netherlands India. The preface announces to us that the archives of Government have been thrown open to the Editor, whose well known zeal in the pursuit and advancement of science, and indefatigable industry, will turn to the best advantage the opportunity now afforded him of making known to the world the treasures which they contain. The 1st. number, which appears to illustrate the general plan of the work as explained in the preface, contains articles under four leading divisions. The first of these, "Verhandelingen", contains a history of the Macassar Celebes and the parts subject to it, and a general review of the condition of Netherlands India during the year 1846 We shall give a translation of the latter in our next number. Under the second head, "Boekaankondigingen", is a review of Dr. F. Junghuhn's recent works on Java and the Batta lands in Sumatra. The third head, "Mengelingen", contains a poem by Mr Deventer. The fourth division, "Berigten," presents us with several notices of recent events of interest in Netherlands India. We have only at present room for the following extracts from the latter:

EARTHQUAKES AT BAZUKI, BANJUWANGIE AND BOLELING.

The Earthquake which, according to the Java Courant of the 3d. March last, was felt on the 17th. Feb. at 10 o'clock at Bazuki and more heavily at Banjuwangie, manifested itself yet more powerfully at Bolcling. The commandant of the fort there relates, "at

five minutes before 10 o'clock A. M. today, very heavy earth shocks were felt here within the redoubt. The weather was, as it has been for some days, clear and dry, the sea very calm." The Officer of health there says, that the shocks were from the S. E. to the N. W. It thus appears probable that the igneous focus (brand punt) was under one of the volcanoes of the Island of Bally.

JOURNEY OF DR. SCHWANER FROM COTI TO PONTIANAK IN BORNEO.

Most important tidings have been received from the member of the Natural History Commission, Dr. C. Schwaner, who for a considerable time has been journeying on the Island of Borneo, concerning his experiences amongst of the inhabitants of Kahayan river, and his endeavours to trace out the source of the Melawy river. The first named stream falls into the sea on the south coast of Borneo, between Sampit and the Island Bekompay. The Melawy, in particular, is very important, because it stretches from the west coast into the heart of Borneo, and so little has been known of it until now that we even remained uncertain how far it was navigable. On the 25th. Dr. Schwaner left Banjarmassing with the purpose of making a second attempt to reach Pontianak by a path overland, of which the knowledge must be considered as altogether necessary, above all for the designs which Government cherishes respecting Borneo, To attain this end his plan was to row up the great Dyak or Kahayan river, in order to seek then from its northern extremity a path to Kattingan, and from thence to the springs of the Melawy river. In the first part of this purpose he was disappointed, while the journey along the banks of this river gave him an opportunity of making himself acquainted with one of the most populous and richest countries which he has yet found in his numerous journies on Borneo. The size and depth of the Kahayan river render it possible for the population to reach the sources of its treasures, which principally consist in extensive and rich gold mines, which are found along both sides of the river. The Ngadju (the true name of the inhabitants of the Kahayan river) stand already on a higher step of civilization

than any of the other races on Borneo. They possess very ample and complicated hadats. The national character leaves much to be wished for, as respects honorableness and honesty, although, on the other hand, their unanimity and national pride are not unaccompanied by courage and spirit for great undertakings. Because the ruling power has yet placed itself little in contact with them, we miss amongst them sufficient respect for and obedience to the behests of the government. The country is beautiful, at some points delightful, and therefore healthy and peculiarly adapted for cultivation. Along the slopes of the mountains are situated their fruitful sawas. At present rice cultivation in ladangs, the working of gold mines, and trade, are the principal means of the subsistence of the inhabitants.

The whole river and its principal branches were traversed by Dr. Schwaner in the space of about a month. He every where received a friendly and distinguished reception. Without exaction they furnished him with the assistance which his undertaking obliged him to require, and answers were willingly given by the chiefs to his questions respecting the people and their hadats.

He further undertook a land journey to the Kapuas river, which had formerly been visited by him, in order to measure the distance between the two rivers, and to become acquainted with their mountain watershed. This journey has furnished the desired results. He has allowed no opportunity to pass of bringing under the notice of the people his relation to government, and as much as was reasonable, of communicating to the chiefs the plans which perhaps will be speedily brought into execution. It is very generally wished there that the government may bestow a greater attention on these districts, and that it would immediately appoint an officer for the administration. The Tomonggong Tundan, head chief of the race of Ot'Danom (Ot=the Malayan hulu, and Danom=to sunggi, thus, the chief of the source of the river) and also the richest Dyak on the whole island, from whose dwelling at Bohon Batu Sule, Dr. Schwaner sent his last accounts to the government on the 12th. December last, has communicated his wishes and requests in writing to his Excellency, the Minister of State, Governor General.

On the 15th. December following, he determined on passing to Katigan, for which a land journey of nine days would be necessary. Since Dr. Schwaner in leaving the Kahayan river would be cut off from all communication with Banjarmassing, there is no further possibility of receiving later tidings of him from any other place than Pontianak itself.

These tidings however will be delivered by himself, for while we write this, he has just arrived at Batavia, after having completed the second part of his undertaking, the reaching of Pontianak overland. In the following number we hope to communicate more particulars respecting his journey. In the meantime we congratulate Dr. Schwaner, science, and the Government, on the completion of this dangerous journey. He is the first who has had the fortune to reach from Coti across through the island of Pontianak. Our readers know the attempt of the meritorious Major G. Muller, who in August 1825, ascended the river Coti in order to reach by this way the opposite side of the mountain chain, and to proceed thence to the west coast, but who was murdered in a dreadful manner, an event of which the circumstances are not yet fully known. Dr. Schwaner will be able to throw a new light on this. The skull of the unfortunate Muller is still preserved amongst the people who murdered him. Dr. Schwaner in vain offered a considerable sum for it to the owner.

Maxima and Minima of Atmospherical temperature at Singapore.

	March, 1848.		April, 1848.	
	Min.	Max.	Min.	Max.
1	72	89	72	88
2	72	89	71½	87
3	72½	89½	71	91
4	72		73	87
5	72	88	73	89
6	74	89	75	90
7	72	89½	74	90
8	72½	82	75	90
9	71	89½	74½	90½
10	70½	92	75	85
11	73	87	74	88
12	72	90	75	88
13	72		76	88½
14		90	75	91
15	74	90	75	91
16		93	76	88½
17	72	92	73½	89
18			75	88
19	72	86	74	89
20	71		73½	
21	72		75	90½
22		91	75	90½
23			77	90
24		89	75	92
25	70	88½	75	93
26		85	75½	91½
27	72	89	74½	87
28	72	90	74½	90
29	73	89	75	91
30	72½	89	74	84
31	74	88½		
Mean	Min. 72. 16 Max. 89.		mean	Min. 74. 35 Max. 89. 24

J. R. L.

THE

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AND
EASTERN ASIA

REPORT ON THE ISLAND OF BANKA.

By Thomas Horsfield, M.D.

In a Discourse delivered by Sir T. S. Raffles to the Batavian Society of Arts and Sciences in September 1815 (Memoirs p. 150. Transactions of the Batavian Society of Arts and Sciences, vol. viii. p. 1.) a reference is made to a Report on Bánká by Dr. Horsfield. This report appeared to be of great interest, because it was probable from the brief extracts which Sir S. Raffles gives from it, that a complete geological analogy existed between Bánká and the southern parts of the Malay Peninsula.* Sir S. Raffles expressed a hope that this valuable Report "would shortly appear in print under the liberal patronage and support of the East India Company." After consulting all the latest works touching on Bánká and finding in none of them any notice of the report, we concluded it had never been published in England, and requested Dr. Hoëvell, the present President of the Batavian Society, to ascertain whether it had ever appeared in Dutch, like some other essays of Dr. Horsfield, or was to be found in the archives of the Society or of the Government at Batavia. No trace however could be found of it in Batavia. We next applied to Colonel Butterworth, the Governor of the Straits Settlements, who at once used his good offices at the India House, and the result was that in a few months we were placed in possession of

* On the Local and Relative Geology of Singapore. *Journal As. Soc. Bengal.* 1847, p. 546.

the manuscript of the original Report itself, accompanied by the following memorandum:

Memorandum as to the accompanying report on Bánká.

"While employed on the Island of Java in the service of the East India Company as naturalist, I visited Batavia in the year 1812, for the purpose of examining the Western provinces of the Island. At this time, in the autumn of the same year, the Lieut. Governor, Thomas Stamford Raffles Esq., appointed me with two other Gentlemen, a Commission to examine the Island of Bánká, which had recently been transferred to the British Government. My colleagues, being soon taken ill, returned to Batavia, and it was left to me to accomplish the object of the commission without their assistance. I devoted about nine months to a journey through the Island, during which I examined most of the tin mines and collected materials for a report, and for the map which was subsequently engraved. In 1814 I delivered part of my report to the Lieut. Governor, who mentioned it in his annual address to the Batavian Literary Society, but the completion of it was at that time prevented by various other necessary duties in Java.

Some parts of it were transcribed to be transmitted to England; this I send herewith under the sanction of the Secretary of the Hon'ble Court of Directors.

It is very fragmentary, and unfit for publication, but should any portion of it be useful to the Editor of the Journal of the Indian Archipelago, ————————, I leave it at his disposal, relying on his judgment in making a selection or an abridgment. More than thirty years have passed since it was written; circumstances have greatly altered the affairs of Bánká, and much has been published concerning it in various Dutch periodicals."

THOMAS HORSFIELD.

Library, East India House,
August 5th. 1847.

It is very true, as Dr. Horsfield remarks, that Bánká has been much changed since the period of his visit, and that later descrip-

tions of it have been published. But no consideration of the kind would have withheld us from doing a tardy act of justice to Dr. Horsfield by presenting his report in full, even had these later descriptions been such as to deprive it of much of its original value. This however is not the case. The Report contains a more complete account of the mineralogical constitution of the island than any that has yet been given. It presents moreover a view of the tin mines at the time when the island was a British possession, and this it is interesting to compare with their present condition and extent. The introductory paper contains also the most full and accurate notices of the history of the island which we have met with. Before receiving the Report we had translated a recent description of the island from the Tijdschrift voor Neerlands Indie, and had likewise procured a translation of a recent German work on it by Dr. Epp. As our readers might justly complain if gave so many successive papers on one island of the Archipelago, when we are in possession of descriptions of many others, which we have not yet been able to publish, we shall give as much as possible of the more interesting parts of these translations in the form of notes to Dr. Horsfield's Report.—Ed.]

INTRODUCTION TO THE REPORT ON BANKA.

In the subsequent introductory remarks I have combined the historical details which were occasionally collected, during a series of enquiries, relating to the general condition of the island of Bánká, its geography, mines and inhabitants. They are not offered as fully authentic, as they depend in a great measure on the memory and veracity of various inhabitants of Plembáng and Minto. But I had an opportunity of directing my enquiries to the most respectable persons at those places, and I have been able to add from incidents which rest on a more solid and respectable foundation. I am by no means impressed with an idea of their importance. I offer them rather with diffidence, as they represent objects of little interest and on the whole, of a gloomy aspect: these are however characteristic of Bánká.

During the first period of the 18th century, soon after its emergence from an ancient obscurity, the island was over-run by an exile from Plembáng and harrassed by the contentions between two princes for the supremacy of that kingdom; during the latter periods, it was nearly ruined by a combination of the most distressing calamities. An interval of rest and prosperity was afforded between these periods from the years 1760 to 1780. The discovery of the tin now attracted numerous foreigners, chiefly Chinese, who with the working of the mines introduced the first attempts at agriculture and commerce; various Settlements were formed, and a commencement was made in cleaning the ancient forests, which had till lately not been disturbed, for the purpose of forming permanent places of residence. The principles of civilization were offered to the rude inhabitants.

During many years of this period, this small island has yielded an annual revenue in Tin, which for a district of the same extent, equals the metallic wealth obtained annually from the mines of Mexico, according to an average calculation of the produce of the whole kingdom; and it is an unpleasant pursuit to follow the circumstances which have contributed to reduce its produce in later periods.

The name of Bánká has been applied to different territories near the southern extremity of the island of Sumatra. Bánká, Plembáng was the ancient denomination of the present kingdom of Plembáng on the Eastern Coast, extending in the west to Bánká-ulu. The name of this district, and of its principal Settlement, has first been contracted into *Bánká-ulu* and finally converted into *Bánkulen*. The situation of *Bánko-Musso* is undetermined, and this name is at present almost exclusively applied to that island, which forms with the opposite shore of Sumatra the Strait of Bánká.

During the first two centuries of the enterprizes of Europeans in India, this island attracted no notice Regular factories had been established at Jámbí, Achín, Plembáng, Bánká-ulu and Pádang, while Bánká was covered with impenetrable forests, and only known as an inconsiderable appendage of Sumatra.

The antiquity of the Settlements of the Dutch in various parts of Sumatra has been preserved by the Historian of India, Valentyn; the

names of the Residents or commercial agents are enumerated in regular succession from the year 1616 at Jámbí and 1620 at Plembáng. The former place was abandoned about the middle of the last century; at the latter place the succession continued uninterrupted to that event which terminated the empire of the Dutch in East India, the conquest of Java and its dependencies.

The productions which directed the attention of the Dutch to Sumatra are enumerated by Valentyn with his usual accuracy, gold, pepper, camphor, oil of camphor, benzoin, sappan-wood, tortoise-shell, amber, dragons' blood and rattans were obtained at the different Settlements. Tin is mentioned as a production of the peninsula of Malaka that was not known to exist in any of the districts or dependencies of Sumatra.

Bánká afforded to its sovereign at this period ebony and embaloo wood, bees-wax and honey, white and black resin (dámár of the Malays) with other productions of equal insignificance, which were received as an acknowledgment of the submission of the inhabitants more than on account of their value; the mines which have lately given a general celebrity to this island were not discovered till after the commencement of the 18th century.

The events of an island of so little importance in former times present nothing memorable for historical detail. The most ancient race of inhabitants have at the present period scarcely attained the first grade of civilization, and have not recorded its history. But a tradition has been preserved among them that Bánká was formerly under the dominion of Java, and the places are still pointed out where the sovereigns resided. They occupied considerable tracts along the western coast, and the principal establishments were at Kuttowaringin, and near the discharge of the rivers of Mendu, Selan and Bánko-kutto. This was the residence of the representative of the sovereign; the name of the Depatty Nusantara has been preserved at the last person who held that appointment. Very extensive remains are still found on the site of the old Settlement.

The traditions of the inhabitants of Bánká are confirmed by the historical documents of the Jávanese, but it is uncertain in what manner

the ascendancy of Plembáng was established on Bánká, whether the island was granted to that kingdom during the ancient relation, which existed between the princes of Java and the sovereigns of Plembáng or whether the inhabitants of their own accord embraced the protection of the latter. It appears indeed in a great measure probable that the western extremity was under the influence of Plembáng at a time when the districts above mentioned, along the coast, were still governed by representatives from Java.

The connection which existed in ancient periods between the kingdom of Plembáng and the princes of Java is reciprocally proved, and confirmed by the Javanese histories, and by the traditions preserved at Plembáng. If a stronger evidence is required it is afforded by the similarity or rather the sameness of language in both ; that which is employed by persons of the middle and higher classes at the capital of Plembáng and its environs, has preserved all the peculiarities of the language from which it is derived, and a native of the central districts of Java notices at Plembáng is doubtful. The remnants of Javanese history inform us that the first sovereign of the house of Madja-pait, Browid-joyo Ongkowid-joyo, granted to his son Ariyo-Damar the kingdon of Plembáng, which already formed a part of his possessions. According to the Javanese chronology Ariyo-Damar proceeded thither in the year 1300 corresponding to the year of the Christian Era : he was accompanied by a large number of adventurers and attendants, and formed the first regular colony in that part of Sumatra.

My enquiries at Plembáng as to the succession of the princes which occupy the throne at present, produced a genealogy which ascends only 248 years, and does not remove the doubts which exist on this subject, even at the capital. These princes are by some derived from Ariyo-Damar the founder of the Javanese colony, by others from the Arabian family of Mulana Ibrahim, who propogated soon after this period the Mahomedan religion through Java, Sumatra and the neighbouring islands. Towards the end of the 16th century, the kingdom of Plembáng was exposed to repeated attacks from its neighbours, the Lampungs: Valentyn asserts that by the assist-

ance of Bántám a conquest was made of the lower country, which however appears to have been of short duration. I shall not attempt to follow the history of Plembáng through the 17th century; very few authentic accounts have have been preserved relating to it. In the year 1660 the town was laid in ashes by the Dutch.

The events which occurred at Plembáng soon after the commencement of the 18th century, being in immediate connection with the affairs of Bánká, deserve to be concisely mentioned. About the year 1720 a civil commotion occurred at that capital which terminated, by means of the interference of the Dutch, in the establishment of a prince on the throne whose direct descendants have retained the government to the present time. It is not probable that any documents have been preserved of the events which accompanied this revolution, and the relation depends on the traditional reports which have been preserved among the inhabitants.

At the death of the prince Susunan Ratu, surnamed Tshandiwalang, which, according to the genealogy preserved at the capital, occurred in the year 1710, the kingdom was divided between two sons: *Mahomud Mangsur*, the elder, resided at Kebbongedde, his brother Sultan *Kama-rudin*, with the title of Sultan Agong, occupied the town of Plembáng, which is now denominated Plembánglámá, as the residence of the sovereign and of the greatest portion of the inhabitants have in late periods been removed above their former situation. The site of Kebbongedde is still pointed out beyond the present capital.

Sultan Muhamad Mongsur before his death, ceded the kingdom to his eldest son who assumed the title of *Sultan Anom*. Some dissention soon occurred in his family, which gave rise to commotions which were followed by a general revolution. *Raden Lambu*, the Sultan's younger brother, of a restless and enterprizing disposition, deserted the capital and visited the neighbouring kingdoms of Johore, Tringano and Siam. He married at *Siánten*, and at his return founded on Bánká the town of Minto as a retreat for the relations of his wife. Having proceeded to the capital he executed those projects which had previously been formed to obtain possession

of the kingdom. Various artifices were effectually employed by one of his adherents, an intriguing courtier who had followed him in his travels. Sultan Agong (his uncle) at Palembáng-lámá had no male issue; by marrying his only daughter he became heir apparent to half of the kingdom; but for this purpose it was necessary first to effect a separation from her husband Pangeran Dyaya. This having succeeded, at the death of his father-in law, Raden Lambu assumed the title of *Sultan Agong*.

Various contentions were now fomented and kept up between the new prince at Plembáng-lámá, and his elder brother at Kebbongedde. The interference and assistance of the Dutch was solicited and obtained by the successor of Sultan Agong. Several vessels were sent from Batavia. A stratagem was employed to prevent Sultan Anom from employing those means of security and defence which he possessed. After an apparently friendly visit a fire was opened on his palace from the ships in the river; being at the same time attacked by land, and with boats from Palembáng-lámá, Sultan Anom was obliged to desert his palace. He first retired to Dshambi and subsequently established himself on Bánká where he collected his adherents and for ten successive years bid defiance to his brother: He would doubtless have renewed his pretensions in a formidable manner and encountered him at the capital had he not been finally routed by an expedition from Batavia, of which the records are still in the archives of that place, and which terminated in the year 1732. Some extracts will be added from it in the sequel.

By this revolution Raden Lambu, the younger brother of Sultan Anom, and by matrimony successor to Sultan Agong, obtained the entire possession of the kingdom of Plembáng: he commenced his reign in the year 1722 with the title of Sultan Mahmud Badar Udin. A regular contract was now concluded with the Commissioners from Batavia in which he engaged to furnish, on certain fixed conditions, the principal productions of Plembáng and Bánká to the Dutch East India Company, which was ratified at Batavia in the following year. The names of the principal person who formed this tract, Abraham Patras, as well as of the commander of the expedi-

tion which defeated Sultan Anom at Kebbon-gedde, William Daums, are still familiar to the whole inhabitants of Plembáng.

These notices are confirmed by the testimony of Valentyn: the event happened shortly after his return to Europe. In concluding the account of the affairs of Plembáng, he introduces the information received from a correspondent at Batavia. An expedition consisting of six vessels and carrying 4 or 500 troops had proceeded to Plembáng for the purpose of settling the disputes which existed in the Royal family.

Although this revolution left RadenLambu in the quiet possession of the kingdom at the capital and the immediate neighbourhood, his brother Sultan Anom did not give up his pretensions. Having proceeded to Bánká he gradually collected his adherents from Plembáng and engaged in his service a considerable number of Buginese. With the exception of the new Settlement at Minto the whole island was occupied by himself and his followers.

The Buginese had established themselves at the western extremity at the point Tanjong Ular, whence they controlled with numerous prows the northern part of the island;—Sultan Anom had constructed a stockade at Koba which commanded the eastern coast, and his son Raden Klip occupied the interior at Paku and a range of coast from Bánko-kutto towards Tubuali. These particulars are preserved in the account of an expedition above mentioned which was sent from Batavia in the year 1732 to the assistance of Sultan Ratu by which name the new prince was dignified at Batavia. The details of this expedition display the condition of Bánká at this period. The inhabitants were not united under one chief but divided into numerous small tribes as they are at present. The influence of the new sovereign was very weak, and most of them favoured the exile Sultan Anom.

The effects of the Batavian expedition from Plembáng were to capture and disperse the Buginese at Tanjong Ular, to open a communication across the island from Bánko-kutto towards Paku and to attack the stockade of the Sultan Anom at Koba. In consequence of the reluctance of the inhabitants to yield the necessary as-

sistance numerous disappointments were experienced; Sultan Anom and Raden Klip were enabled to escape, but their establishments were destroyed, and the island of Bánká, being freed from the insurgents, was restored to rest and peace. After remaining some time in Billiton, Sultan Anom, being deserted by his adherents, returned secretly to Plembáng where he was apprehended, conveyed to the upper provinces and put to death; his son Raden Klip escaped to the island of Madura and after long eluding detection by his shrewdness and agility was finally surprised and killed on this island.

The reign of the Sultan Badur-Udin was shortly preceded by two important events in the history of Bánká, the discovery of the tin and the establishment of the town of Minto. The former is the result of accident and was made by natives in preparing a ground for a rice plantation. The ore of this metal is in many districts of the island superficially disposed; a small quantity that had adhered to the mould, was converted into metal by the heat of the burning woods, which covered a plantation. The discovery was communicated without reserve to the sovereign at the capital, according to the natural disposition of the natives, which is characterised by simplicity and honesty, where it was duly appreciated. This happened during the reign of Susunan Ratu Tshandi Walang, above mentioned, shortly before the contentions in the Royal family. The accounts which I procured at Batavia date the period of the discovery in 1711 and may therefore be considered as a confirmation of the tradition preserved at Plembáng; but the attempt to prepare the metal were very rude; before the interference of the Chinese the ingots were small and not cost into regular forms.

The establishment of Minto at this period contributed greatly to give a proper direction to the mining operations on Bánká, and to introduce persons of means and enterprize. The occasion to this establishment has already been mentioned; it served as a retreat for the wife of Raden Lambu and her relations, at his return from *Siánten*. This island, a dependency of the princes of Johore is situated near the southern extremity of the peninsula of Malacca; I have not been able to determine the denomination which it receives

from Europeans. * Several families, the names of the heads of which are recorded by the inhabitants of Minto, formed the first stock of colonization: the chief of these was the father-in-law of Raden Lambu: they were of Chinese descent, but their ancestors for several generations had embraced the Mahomedan religion. A large number of their relations and of others adventurers from this and from the neighbouring islands gradually followed; the physiognomy of the present generation evidently indicates their Chinese derivation; they have formed few matrimonial connections with the neighbouring Malays or with the original inhabitants. The custom of marrying a daughter of one of the principal inhabitants of Minto has been kept up as a religious duty by the sovereign of Plembáng, and it has been considered as treasonable for a subject from the capital to contract matrimony with any of the daughters of the descendants of the first emigrants. The present Sultan, who has been elevated since the acquirement of Bánká by Great Britain, has applied for the privilege of following the custom of his ancestors, and a bride from Minto was accordingly provided and conducted to the capital by an embassy from the Court.

This town, which has lately been honored with the illustrious name of Minto, was fixed on part of the territory of a native chief, Pa-*Mento*, from whom it took its ancient name.† The troubled state of Bánká during the first period of the establishment retarded its progress; after the expedition from Batavia by which Sultan Anom was expelled, the population was increased by numerous emigrants from Menangkabau, Pontiana, Java and the neighbouring islands under Johore and Linga.

It is not known exactly at present, in what district the discovery of tin was made, but the first attempts at refining the ore were undertaken by the inhabitants of Minto. The industrious enterprising character of the nation from which they are descended early directed their attention to this object, and according to the relation of the inhabitants the mining operations were very extensive after the defeat

* Pulo Siantan is the southern large island of the north Anambas. Ed.

† which the Dutch have very properly restored. It is now written Muntok. Ed.

of Sultan Anom. They were conducted both by the regular inhabitants of Minto and by numerous Chinese adventurers who resorted to Bánká; the latter occupied chiefly the banks of the river Teluk Rombiya which were very rich in ore. Severe contentions frequently arose concerning the tracts containing the ores or the employment of the water necessary in the operations; bnt the inhabitants of Minto were always peculiarly indulged by the sovereign, and if their reports may be credited they received a price for the tin they manufactured exceeding by one fourth the value paid to the Chinese.

The next Settlement, after Minto, was formed at Belo about 8 miles to the eastward on the same tract of coast, by a Chinese whose name is celebrated on the island and whose descendants have to the latest periods maintained the administration of the chief mining districts. *Assing*, from his importance and influence denominated Captain of the Chinese, gave to the operations as much facility and regularity as they are capable of with the description of persons employed; he introduced from China and Borneo persons acquainted with the processes of collecting the ore and refining the metal as they are conducted in those countries; he likewise constructed the various implements and machinery according to the models there employed, and he particularly taught the judicious use of water in the different operations connected with mining, with the application of canals or aqueducts. A determinate form and weight was fixed for the ingots which they have preserved to the present time.

About this period the administration of the mines, which had previously been farmed to individuals was assumed by the Sultan, and the Island was divided into different portions. The favorite courtier above mentioned, by whose advice and assistance he ascended the throne, was the first person who was charged with the superintendence of this administration, and his descendants have preserved a share in it to the latest period. All the records which might tend to point out the succession in which the settlements were formed in the different districts have been lost and destroyed on Bánká, or remain at Plembáng in obscurity with the families of the former ad-

ministrators. The verbal reports obtained from the old inhabitants, have therefore in this sketch been the only sources of information.

From Belo the enterprizes were directed to the districts bounding the Bay of Klabbet, which in former periods was favorably situated for the navigation of the vessels commonly employed by the natives, and was important as long as the mines in the neighbourhood were productive. Mines were opened on both shores of the bay ; on the east side those of *Sumut* and *Belinyu* have been worked to the present period, while those of *Sayang* and *Pand-jee* have been exhausted ; along the western shores, the ancient mines were situated in the districts of *Klabbet* (now called Klabbet-lama) and of *Anten*, whence the operations, as the ground was exhausted, were successively carried on westward to Mampang and Tinga, in the centre of the Peninsula, where the most productive mines of the whole Island are still worked in the vicinity of the establishments of *Klabbet-baru* and of *Jebus*. As the Chinese, eager to participate in the labor and profit of the mines, increased and exceeded in number the demand for hands in the districts above mentioned, the enterprizes were directed to the Eastern coast. *Sungie-liat* the nearest district to Sayang (which is situated at the southern extremity of the Bay) was first attempted, and, according to the accounts of the old inhabitants, the mines in this tract, afforded in the commencement, in particular spots, an almost incredible produce.

From Sungie-liat the operations were carried along the whole eastern coast to Tanjong Merikat, the furthest eastern point of the Island north of the straits of Sipar, and the mines of *Pangkal penang*, *Marawang* and *Kába* were successively opened, with many others of less importance which will be particularized in the account of the mines. The operations in all these districts were conducted almost exclusively by Chinese, according to the regular method employed in the northern peninsula and at Belo, but the disposition of the beds containing the ore afforded in many instances a facility in the districts of Sumut, Klabbet and Anten. The strata were often found superficial and highly productive in circumscribed spots, which, though not extensive, consisted in some instances almost purely of

ore of tin. By a judicious selection of these situations where the supply of water co-operated with a rich territory, the miners obtained a reward for their labor far more abundant than in after periods, and many were enabled to revisit their mother country; these are the present accounts of the old inhabitants.

From the environs of Belo some attempts were also made to the eastward, and the mines of Tampelang were opened soon after those of Sungie-liat; but in general the western coast is less productive than the eastern, and the Chinese formed no fixed establishment in the portion of the Island to the south of Tampelang.

Some mines were also attempted in that extensive interior district which bounds Kabo and Pangkal- pínang to the west, but they were conducted exclusively by the original inhabitants, as the Chinese were deterred from situations in which the refined metal must be far transported by land. The former inhabitants of this part of the Island, called generally *Paku* like those of Billiton (more correctly Blíton) at present, were celebrated for working the iron ores which are distributed abundantly through most parts of Bánká.

In the extensive tracts of *Tubuali*, *Nyeery*, *Ulim*, *Permissang*, *Banko-kutto* and their dependencies along the western coast (to the south of Kotto-waringin) the mining operations were likewise almost exclusively carried or by the original inhabitants, who, as far as regarded the smelting or refinement of the ore adopted the improvements introduced by the Chinese, while in the collection of the ore their division into small parties did not admit the regular methods employed in other parts of the Island. Some of the districts last mentioned towards the southern extremity, have contained (and still contain) rich stores of ore.

This rapid sketch of the progress of the mines, shews that operations have been attempted in every part of the Island, with the exception of the farthest southern extremity, (between the eastern boundary of Tubuali and point Tánjong Merikát) and the confines of the southern fort of the mountain Marass with the adjoining districts in that and in a western direction.

Some information is afforded as to the extent to which the busi-

ness of mining was carried on in Bánká about the middle of last century, by the reports of a commission sent from Batavia in the year 1755 to regulate the affairs of the East-India Company at the Court of Plembáng, and to regulate the existing contracts. An accurate statement is annexed to this report of the annual quantity of Tin received at Batavia from Plembáng from the year 1733 (the year preceding the expulsion of Sultan Anom) to the year 1754. The produce had gradually increased from 1110 piculs or 148,000 English pounds to upwards of 16,000 piculs or 2,133,333⅓ pounds: the largest quantity was yielded in 1751 and amounted to 16,884 piculs.

A calculation is added from some enquiries that were made at Minto. by one of the members of the commission, according to which the possible annual produce of the mines is estimated at 73,000 piculs, founded on the number of furnaces then existing on the Island, and the quantity of ore daily refined on an average at each furnace; but the data are vague and the calculation apparently much exaggerated. The mines at this period were confined to Minto, Belo and the environs of Klabbet bay.

The death of Sultan Mahmudbadur-Udin occurred in 1756; he was succeeded by his son who took the title of Sultan Ratu Achmat Nadja Mudin, and whose reign continued to the year 1776. During this period both Plembáng and Bánká enjoyed an uninterrupted tranquillity. The prosperity of this reign has even become proverbial at the capital, and at the late succession, the new Sultan, who was raised to the throne in the place of his exiled brother, who had deserted his residence and duty, was anxious to take the name of his grand-father, on account of its favorable recollection among the inhabitants of Plembáng, at the present day. During this period the produce of the mines had increased to such a degree that the quantity of Tin carried to Batavia, according to contract, exceeded the demands at that place, and led to a limitation of the quantity to be accepted annually by the government of that place, a measure impolitic in the highest degree, as it opened the way and sanctioned indirectly that habit of clandestine sale and smuggling which, but few

years later, the same government had not the means to suppress. Many of the old inhabitants of Plembáng, whom I interrogated, speak at the present time with rapture of the prosperity which was enjoyed by all conditions of people during this reign, and the truth of their relations is confirmed by the documents preserved at Batavia.

Sultan Ratu Achmat Nadja Mudin, who in the last year of his reign was called Susunan Ratu, was at his death succeeded by his son under the title of Sultan Mohamed Baha Udin, whose reign was protracted to the year 1803. Nothing remarkable distinguished the first period: a diminution was gradually experienced in the annual proceeds of Bánká which was ascribed to an exhaustion of the richest districts in which the mines were worked; those of Minto and Belo were almost entirely abandoned by the Chinese, and left to the Malays and original inhabitants.

From the year 1785 a new era commences in the history of Bánká, distinguished by a succession of calamities which gradually effected almost the complete ruin of the island. Those persons who on account of their intelligence and residence on the spot must be supposed best qualified to form an opinion, unanimously consider these calamities as the consequence of the war in which the Dutch had been engaged with the princes of Rhio and Linga. These were the descendants of the Malay princes of Johore; and without tracing the circumstances which had occasioned their removal, it may be sufficient to remark that, having abandoned their capital at Johore, they retired to the islands at the extremity of the peninsula of Malacca and established themselves on Bintang and Linga, which according to Valentyn, had been conquered by their ancestors in 1606. The prince first in rank occupied *Rhio*, on the former island, with the customary presumptuous title of Yang di pertuan Raja; and against this capital the expedition of the Dutch was principally directed. In later periods the residence of the first prince has been transferred to Linga, while the younger prince, Raja Muda, resides at Rhio. They have both preserved that character and disposition in later periods, which even at a time when they were more respectable was often attributed to them. Limited not so much in territo-

rial extent, as in the number of their subjects or in their ability to command their services, they have at all times employed the aid of pirates, whom they have fostered and encouraged; and it was on this account principally that the expedition was undertaken from Batavia.

After they had been severely chastised by the arms of Dutch, they continued notwithstanding to send forth numerous small vessels, which greatly annoyed the traders in the neighbouring seas, but not content with this mode of warfare they attempted to affect their enemies by means of their allies, and for this purpose commenced an attack on the island of Bánká, soon after the year above mentioned, with the view to destroy the settlements and to reduce the produce of the mines.

The description of people engaged for this purpose were of *two* kinds. The first are distinguished by the name of Lanons. They inhabit several islands along the north and north-eastern coast of Borneo and form a regular profession of piracy, although they had never extended their range to this neighbourhood before this period. The others have from time immemorial formed part of the population of Johore, Linga and Rhio, and the neighbouring islands, and, on account of their particular mode of life, are called *orang laut* or persons inhabiting the ocean. They are also distinguished by the names of *Rayads*. Some of them are still found in various parts of Bánká (and Billiton) and a short sketch of their character, habits and mode of life will be subjoined below. But their chief retreat (in these seas) has been at Johore, Linga and Rhio, and though they have almost indiscriminately committed piracy, they have never to this period molested their ancient associates in Bánká.

No written records have been preserved of the successive attacks on various parts of the island, and I depend therefore on the verbal relations of the natives. The disasters commenced with the surprise at the settlement at Klabbet-lama: this was made before the co-operation of the Lanons was obtained, by the Malays from Siak, a well known kingdom on the eastern coast of Sumatra, formerly a dependency of Johore, and inhabited by a similar race, disposed to plunder and piracy. The assailants succeeded so far as to secure all the

metal their vessels were capable of conveying, with the most valuable possessions of the inhabitants, most of whom saved themselves by a precipitate flight into the forest. This happened about the year 1789. A second visit, which was made by the Lanons a few years later, occasioned the total removal of the inhabitants, who formed a new settlement at *Klabbet Melabun* which has been finally transfered to *Klabbet-baru.*

The first regular enterprise of the Lanons was directed against Sungie-liat in the year 1792: the inhabitants being taken by surprise, a number of them were killed in the first attack; but the Lanons were finally repulsed by means of the assistance afforded by two Arab merchants whose vessels were lying in the river. Three years later the attack was repeated: the Lanons now found a regular stockade which they could not overpower, but they annoyed the settlement by seizing the supplies which were sent from Plembáng. A third attempt was soon made with increased vigour in which the Lanons undertook a regular seige of the stockade, but they were finally repelled, and on their return destroyed the settlement at Klabbet-laut, as just related.

From this part of the eastern coast, where the enterprises of the pirates were resisted by the population, and the means of security and defence which the inhabitants had provided, they directed their exploits to the southern extremity of the island. For their place of landing they selected the outlet of the river *Kappu*, a remote and inaccessible situation, where no impediments could be offered, and gradually continued their course to Tubuali. Several months were employed in this undertaking; the defenceless inhabitants they encountered on their route were seized and carried away in slavery, the chiefs or Batins were murdered. The other Settlements along the western coast Ulin Nyeery and Banko-kutto were mostly deserted by their inhabitants before the Lanons could reach them; many families retired further to the interior or to the northern parts of the island, which were less accessible, where they have remained to the present period, especially in the interior of Minto, Belo and Palengas.

With the exception of Tubuali, where a stockade had hastily been constructed, all the rivers along the western and southern coast, especially those of Banko-kutto, Selan, and Kappu afforded shelter and security to the Lanons, their numbers rapidly increased and at last they ventured an attack on Koba, the nearest settlement on the eastern coast which they overpowered and plundered. They now extended their range further to the north; commanding the outlets of the rivers Koba, Kurou and Pangkul, they ascended with small prahus in the interior, attacked the important and extensive native settlement at Paku and repeated the outrages committed at Tubuali. According to the accounts which I received in the nearest remaining Settlement of Pangkal-penang and Tirak several hundred families were carried off in captivity, but by far the greatest number perished in the woods from fatigue and want; they fled to the northern districts (of Pangkal-penang, Tirak Depa, Marawang and Sungie Liat) where they found a precarious shelter. The Depatty of Paku perished in the attack; his nominal successors are now established at Tirak.

Encouraged by the success of the Lanons, the Rayads, their associates abovementioned, of a disposition equally cruel and rapacious but less vigorous or enterprising, now ventured to participate in the spoils of Banka. They were at this period conducted by Panglima Raman a notorious pirate, whose history and career are involved with the affairs of Bánká, and who is celebrated as much for his exploits on shore as for his successful interception of those vessels from Plembáng that occasionally attempted to bring relief to the starving inhabitants.

Panglima Raman is a native of Linga. His father, a private trader from Bugis, was married to a daughter of one of the principal Rayads of that place. As a child he was noticed by the prince (at this time the Raja Muda) on account of his appearance and sprightliness, and employed as one of the followers of state. As he grew up, the disposition of his maternal ancestors developed itself, and was strongly encouraged by the prince. He finally became chief of the Rayads of Linga. As such he first conducted the piracies on the

coast of Java; and in his successive expeditions finally became sufficiently bold to surprise small vessels of the Dutch. and of other European nations, at the month of the river of Plembáng. He was present at the attacks on Rhio and Malacca. After the defeat of Koba by the Lanons, he fixed himself permanently at that place, whence he carried on his piracies in the neighbourhood. One of his principal exploits was against the Settlement of Pankal-penang which he successively plundered. He succeeded in overpowering the chief from Plembáng called Tamungong Patshienan, and the inhabitants of the stockade were obliged to retire. He proceeded into the interior, seized many of the original inhabitants and carried them off in captivity. He kept possession of the Settlement several months.

The recovery of Pangkal-pínang for the Sultans of Plembáng was committed to Abdullah-Djalel an enterprising Arab. With the assistance he obtained from Sayang and Marawang he established a new stockade: he collected the original inhabitants who, from numerous parts of an almost impenetrable forest attacked the prows lying in the course of the river and finally succeeded in dislodging Panglima Raman. In his return and during his continuance at Koba, this pirate ravaged all the smaller settlements from Tanjong Merikat to the vicinity of Sungei-liat. But at Robo his Ráyads were defeated by the Chinese. The stockades which are still found even at the smallest regular establishments of the Chinese indicate the terror in whichthe inhabitants lived to very late periods.

About this time the Lanons entered the large river of Marawang; they proceeded up a branch that leads to the settlement of that name, and surprized the inhabitants in the stockade, who fled into the forest, but being soon rallied they forced the pirates to retire. These continued their incursion higher up the river to the village of the Depally Barin and finally to the foot of the large mountain Morass, seizing everywhere the defenceless inhabitants and carrying them away as slaves. These vexations were frequently repeated on various branches of this river.

Nearly at the same the settlements of the Eastern peninsula of

the northern division of Banka were likewise visited by the Lanons. They commenced on the eastern shores of the interior Bay of Klabbet. At *Belinyu*, they were repulsed as the stockade had been put into a good state of defence by Demang Satjo Truno, an administrator from Plembáng of Chinese descent. At *Lumut* they overpowered the stockade and plundered the inhabitants; but a new stockade was soon constructed by the Demang just mentioned on a more elevated spot, which has resisted their later attempts. In my visit to this neighbourhood I saw the remains of the deserted settlement.

Along the large river of Sayang the incursions were chiefly directed against numerous small settlements of the original inhabitants, and here, as well as in the passage through the outer and inner Bay of Klabbet many spots were pointed out to me, solitary at present, which formerly supported numerous inhabitants and flourishing villages.

The eastern coast of this portion of the Island was particularly exposed to the ravages both of the Lanons and Ráyads: The condition of the inhabitants of *Mahur* and *Teneang*, simple and defenceless in the highest degree, particularly invited their attacks. The former district in particular was almost drained of its population: Teneang, nearer to the settlement at Sungie-liat, occasionally received some support and many of the inhabitants secured themselves in a stockade which still remains at Binting Bakki. But notwithstanding the inroads of the pirates have been carried to the heart of this peninsula, and the miners at Lampur, Katta and the vicinity of Sayang have been surprized at their work and carried away. Each of the mining districts has eventually been obliged to build a stockade for the security of the inhabitants, although residing at a great distance from the sea or from a large river.

While one party of the Lanons and Ráyads molested the eastern settlements, another carried on its enterprises along the western coast to the neighbourhood of Minto. Meeting no effectual resistance from Plembáng, those vessels which were occasionally sent out for the relief or support of Bánká were interrupted on the coast, and tended only to encourage the audacity of the pirates.

The settlements of Kutto-waringin and Tampelang were now successively plundered, the stockades burnt and the environs laid waste. The large rivers of Mendu, Kotto-waringin and Jering afforded them in this part of the island a most convenient shelter whence they carried their enterprises to Belo and Rangam, in the sight of Minto: the inhabitants of these settlements relate at the present period with earnest simplicity the dread in which they constantly lived. The only inhabitants of Plembáng who attempted with some success to limit their progress was Demang Singa Yuda commonly know as Demang Singa.

In several of his expeditions he succeeded in liberating numerous inhabitants who had been captured, he entered successively the rivers of Jering and Kutto-waringin, and finally obliged the pirates to relinquish their permanent establishments in this part of the island, but the effects of their ravages are at the present time very obvious. At Kutto-waringin and Tampelang many of the inhabitants have been carried away, and other have contracted a disposition to pillage and murder from the example of the pirates.

One of the last exploits of the Lanons was undertaken against the settlement at Jebus. The difficulty with which an enterprize is conducted in this part of the island, on account of the impediments afforded by the natural situation of the country, with the vicinity of the capital, yields the strongest proof of the defiance of the Lanons, and of the reluctance of the Sultan of Plembáng to afford assistance to his unfortunate subjects on Bánká. But at this place the extensive population of the Chinese was alone sufficient to repel the attack; the Lanons however occupied all the rivers along the northern coast of the island, whence they annoyed the inhabitants by inroads into the country.

The settlement of Sungie-bulu bounding that of Jebus was at this time guarded by Demang Surontakka, better known as Demang Minyak, the chief of the Ráyads of Bánká in the service of Plembáng; it was, notwithstanding, exposed to partial molestation especially on the northern coast.

The town of Minto is the only inhabited part of Bánká which did

not suffer an attack. Two causes have probably contributed to afford it security; the connection which still existed between the present generation and many families derived from the ancient inhabitants of Johore latterly removed to Linga, and the apparent posture of defence which the inhabitants of Minto assumed. Shortly preceding the arrival of the Lanons, the princes of Linga had promulgated the report of an intended attack on Minto, in order indirectly to annoy the princes of Plembáng. A fortification was in consequence commenced with great energy on a commanding situation above the town, which on account of the contribution of a sum of money by the Sultan, has been named *Binting Saribu;* but it has never been completed.

But although Minto did not suffer immediately, like the other parts of Bánká, from the visits of the Lanons, it experienced during this period calamities of a different kind, which affected it nearly in the same degree as the disasters above enumerated affected the other parts of the island, and affords another proof of the culpable negligence with which the affairs of Bánká were conducted at the capital.

Soon after the attack of the Lanons on the southern parts of the island, nearly one half of the inhabitants of Minto, including most of the principal families, abandoned their native place and retired to Linga. This emigration was occasioned by the treatment of one of the principal inhabitants of Abang-tawi a direct descendant of one of the ancient families which established Minto, and who commanded the esteem and affection of his fellow citizens in an eminent degree. Under the accusation of having committed some atrocious offence, he was summoned to the capital where, without a hearing, he suffered a violent death. Disgusted and incensed at this tyranmical act, all his relations and friends deserted their habitations at Minto, and retired into voluntary exile. Another affliction of Minto displays in a stronger degree the excessive indifference of the Sultan of Plembáng regarding the affairs of Bánká. Raden Japhar, a near relation of the Sultan, having carried off by force the lawful wife of another person, was threatened with punishment. He therefore privately left the capital and retired to Linga, where

he obtained the protection of the king, who as the enemy of Plembáng artfully associated him with Panglima Raman, whose occasional retreat was still at Koba. After various piratical expeditions which they undertook in conjunction, they carried on a regular blockade of the western coast of Bánká; they occupied for this purpose, a situation near the Nangka islands, whence they intercepted all the vessels that passed through the straits, or that attempted to leave the river of Plembáng. About this period they also plundered, in fellowship, the stockade of Jebus. The rank of Japhar was sufficient to prevent any opposition from the inhabitants, whether Chinese, Malays or natives, and they carried away, without meeting an attempt at resistance, a large store of tin, and everything valuable which the stockade contained. Having separated himself from Panglima Raman, in consequence of a dispute concerning a valuable prize (of which the annals of Java can give some account) Japhar visited the kingdom of Kedah, and upon his return permanently established himself at Minto. Here he bid complete defiance to his sovereign (who to appearance approved of his situation) he occupied the fort of the Sultan, Bintang-saribu above mentioned, and exercised over the inhabitants of the neighbourhood every species of unlawful oppression.

He summoned all the officers of the most distant settlements, in the regular service of and under responsibility to the persons to whom the sovereign had committed the administration of the mines, and compelled them by threats and by violence to deliver to him at Minto the tin they manufactured or the money they had charge of. Every species of abuse and torture was employed to discover the places where their actual or supposed treasures might be concealed, and many of the unfortunate inhabitants were cruelly put to death. The spot is still pointed out at the river Minto-azin whither the victims were conveyed at night to satisfy the revengeful spirit of this miscreant.

It is probable that the same causes which prevented the formerally of Plembáng from affording succour to Bánká, prevented also an interference on account of the atrocities of Japhar; it is evident

that the interest of the Government at Batavia was affected by the failure of the produce of the mines, and the flight of Japhar had originally been occasioned by an injury to one of its subjects; its forbearance therefore must be ascribed to inability. At the event of a commission at Plembáng and Bánka in 1802, Japhar's suspicion were roused; he fled to the mountains and finally attempted an establishment at Bánko-kutto, but this was of short duration; with the intention to become a Hádji he engaged to in a voyage Mekka, but perished in sight of Bánká.

The narrative of the particular disasters of Minto does not complete the detail of calamities. Two other causes contributed to distress the inhabitants and to reduce the population of Bánká. The incursions of the pirates were extended to the interior of the island; the inhabitants were surprised at their plantations; if they escaped by flight, their rice-grounds were notwithstanding in most cases abandoned, or crops, almost ripe for harvest, were wantonly destroyed. The usual supplies from Plembáng and other countries were detained on the coast, and famine was the unavoidable consequence. Even in the most productive seasons, the rice cultivated on Bánká is insufficient for the consumption of the aggregate number of inhabitants, and any deficiency in the regular supply occasions want. The culture of those vegetables which might form substitutes in case of scarcity of rice is totally neglected by the natives. It is therefore not surprising that the inhabitants in many instances preferred a voluntary slavery and exile to the accumulated evils which harassed them in their native country.

At this time the small-pox was introduced, probably by the Lanons, at different part of the island, and spreading rapidly, raged with the virulence of a malignant epidemic. The inhabitants having been long exempt from this disease, the opportunities for its propogation were proportionally great, especially as it came upon them unawares; and it is generally supposed that nearly one half of the remaining population was carried off by this cause.

The dread which exists among the natives of Bánká of the small-pox has been, from the most ancient periods, excessive in the highest

degree. Flight is their only resource to escape an attack. As soon as the symptoms are perceived or expected, a patient is abandoned infallibly without mercy or consideration. All the other members of a family, or the inmates of a house retire precipitately into the woods. From this habit there is no exception. No ties of consanguinity or affection can retain an attendant for the unfortunate patient, and he is indiscriminately left to his fate.

This feature in the character of the inhabitants is not sketched from partial information. The accuracy of the statement rests on an unanimous report in every part of the island not only of the natives but also of the Malays and Chinese. Wherever my enquiries were made I was assured that a mother infallibly abandoned her child as soon as she suspected by the symptoms the approaching disease, and that no consideration of affection or duty could retain the husband with the wife in the case of an attack of the small-pox. If a patient attempt to follow his relations and friends in their desertion he is destroyed without mercy. This quality in a race of people possessing in many other respects good sense and considerable propriety of conduct shews their near approach to the condition of savages, in which little else is regarded than self-preservation.

The condition of the inhabitants at this period in various parts induced them to give themselves up to voluntary slavery to escape the evils which awaited them on their native soil, and the name *Penggawo Sengkang* has been preserved in the memory of the Bánkánese. A native of Macassar and habituated to the traffic in slaves, he employed the disasters of Bánká to his private benefit. Provided with the common necessaries of life he coasted along the western side of the island with small vessels on which he received many persons who gave themselves up to his mercy in order to escape the combined miseries which threatened them from famine, pirates and disease.

From the year 1804 the Lanons gradually retired out of this neighbourhood to their accustomed range in the eastern seas. Little more was afforded to their enterprize by the exhausted state of

Bánká, and even the Ráyads, probably from the same cause, diminished the frequency of their visits. But a new species of vexation now originated, likewise from Linga, Rhio and their dependencies, which, by diverting the produce from its proper channel, affects directly the interest of the sovereign. Numerous small prows infest the coast under the pretence of fishing; these are chiefly manned by Chinese, who when not observed ascend the shore and obtain from the miners in remote situations on low terms, chiefly by barter, the ore of tin they have in store, which in this state is carried off to be refined at Linga and the vicinity. The vessels with which it is undertaken are called *pukats* or fishers, and these are often accompanied by Ráyads who come for the purpose of piracy.

A retrospect upon the affairs of Bánká from the year 1785 presents, with little variation, a gloomy picture. About 20 years before this period not only the produce of the mines, but also the condition of the inhabitants in regard to comfort and prosperity, had attained its "maximum"; it soon experienced a melancholy reverse. But, although all parts were affected by accumulated calamities, they did not suffer equally. The great south eastern division of the island was beyond the others desolated; with the exception of the districts of Pangkal-penang and Tubuali, the stockades of which afforded a precarious shelter to the Chinese inhabitants, the population of this extensive portion of the island was reduced to a few straggling fugitives, and the anciently flourishing territories of Koba, Paku and Bánko-kutto have been converted to a desert; both at Pangkal-penang and Tubuali the miners have often, for a considerable space of time, been deterred from their work.

The eastern peninsula of the northern division of the island from its more ancient occupation, and more regular means of defence, was, at least at the principal settlements, better enabled to resist the pirates; it was also in great measure peopled by Chinese. Sungie-liat, Belinyu and Layang though repeatedly attacked were never completely overpowered, and Marawang and Lumut though temporarily defeated were soon re-established, and the mining operations were never entirely interrupted. The exposed situations of

Mapur and Jeniang and the mines in that direction, as has already been stated, suffered most from the aggressors.

The western peninsula of the northern division being in a measure overawed by the vicinity of the capital was more cautiously attempted: but besides the entire desertion of the settlement of Klabbet-laut, this portion was equally harassed with the rest by the interception of all supplies; and the audacity of the pirates may be estimated by the incursions they made here to the mines of Sunee in the neighbourhood of the large settlement at Klabbet, carrying off captives the defenceless miners they found at work, or surprizing them at night in their habitations.

The indifference of the inhabitants has preserved but few accurate dates relating to the events above detailed; those which I collected at Minto from written documents place the first attempt on Klabbet in 1789; the attack on Sungie liat at 1792; the expedition through the southern districts by way of Kappo to Tubuali between 1792 and 93; the defeat of Koba and its consequent occupation by Panglima Raman in 1793: after which the other attacks occured in rapid succession.

The emigration from Minto of numerous families on account of the fate of Abang Tawi took place in 1792: the flight of Raden Japhar from Plembáng in 1797; the attack on Jebus by the Lanons in 1790; and the death of Raden Japhar in 1804. In the year 1803 Sultan Mahmud Badoor Udin (the second) succeeded his father on the throne of Plembáng, but the calm which soon succeeded in the affairs of Bánká was not owing to his endeavours to relieve the distresses of the island; if the relations given by the natives are just, he was more reluctant than his father to employ his means for its relief. The details which are given at the present period by the inhabitants of the late condition of the island are characterized by a uniform narration of calamities. The fatal effects of the small-pox, the fate of the natives perishing in the woods for want of food, or giving themselves into voluntary captivity, and the excesses of the Lanons are the constant themes of conversation, and are repeated to the stranger with that pathetic simplicity which vouches for their

truth. A respectable native, Demang Satjo Truno abovementioned, in giving an account of his labours and fatigues in establishing the stockade at Mampang, assured me that his rest at night was disturbed by every rustling leaf, he added with apparent sincerity since Bánká had become a British possession he reposed in safety. This is truly the sentiment of the inhabitants in general whether Malays, Chinese or original natives. The statements in preceding parts of this introduction as to the former conduct of the sovereigns of Plembáng to this unfortunate island require no comment. The interest and happiness of the inhabitants without exception is deeply concerned in the change of government. The miners often oppressed by the officers of Plembáng confide implicitly in the justice and liberality of the present administration: the natives are secure from being surprised at their plantations by the pirates. The re-establishment of many productive mining situations will be attempted again in the extensive southern districts; many of the exiled nation have already returned or await anxiously an opportunity to revisit their native shores.

It is not requisite to the object of this introduction to report the detail of the circumstances connected with the acquisition of Bánká; and the authentic documents relating thereto have already been made public under the sanction of government.

If it were necessary to increase the number of accusations against the exiled Sultan, these would largely be afforded by the unfortunate natives of Bánká, and by their reproaches for withholding that security and protection which they deserved, as his own riches and greatness as well as those of his ancestors were chiefly derived from the revenue of that small island, and even the superstition of the capital has discovered in his fate a just punishment of this indifference to the affairs of Bánká, superadded to the violation of the most sacred engagements. In the month of April 1812, the British flag was hoisted on Bánká: and the following month the rights of the Sultan of Plembáng to the island were solemnly transferred to the British Government.

Of the various inhabitants of Bánká that have been mentioned in

the preceding details, the Chinese and Malays must be considered as foreigners: the mountain-people and the sea-people, as they are severally denominated, are the most ancient race of residents that can be traced, and in concluding these prefatory remarks it may be proper to take a rapid view of them both.

The custom of living on the water is common in various parts of India, it is in some countries occasioned by necessity; those people who are called Ráyads on Bánká and in the neighbouring seas, adopt it by choice and preserve it in situations which would afford a more comfortable mode of life. I transiently noticed their manners and peculiarities in the bays of Jebus and Klabbet: they are here also distinguished among the Malays by the name of *Orang-laut* which literally signifies persons inhabiting the ocean or *sea*-people.

I am not able to determine the extent of their range in the Indian ocean; it is probable that they are dispersed through all the countries where the Malay language is current: their principal rendevous at present is at Linga, Rhio, and the numerous island in the neighbourhood. They have always formed part of the subjects of the Malay princes during their prosperity at Malakka and afterwards at Johore.

Those Ráyads who have preserved their manners pure, inhabit small prows, which carry their possessions and families. These are of the size and kind of the vessels distinguished among the Malays by the name of prow *Kakap*, probably from their supposed resemblance to a fish of the same name in their form and motion; they are equally adapted to rowing and sailing. Their appropriation is uniformly the same: the posterior part is employed as the kitchen, and here a small furnace is permanently fixed; the central space serves for their usual occupations during the day and for their rest at night: several large mats which are rolled up in the day time form its principal furniture: their interior parts contain a small chest in which they preserve their things of value. During the night, and in bad weather, the vessel is covered by a light mat (or Kajang) which when not used is folded over the posterior part. The furniture of each prow is very simple. One harpoon with a shifting

point and a spear like instrument for searching crabs in the sand, some empty cocoanut shells with ore and paddles in proportion to the size of the vessels are always found; besides these I noticed in all the vessels I visited a drum and a comb of uncommon size; most prows carry a favourite cat. A number of long wooden lances, as their common weapon of defence, are always placed in conspicuous parts. These they wield with much dexterity. The larger prows (especially those intended for warlike purposes) are provided with rantakkas, firelocks, spears and Malay cutlasses.

Each prow carries a large sail. The day is spent in small excursions on the ocean, at night the vessels are anchored near the shore or fixed to a pole; smaller vessels are generally drawn upon the beach. When opportunities allow they seek the shelter of small bays or the outlets of rivers. The food of the Rayads is principally derived from the ocean, and affords an additional reason for the propriety of their name. They often subsist for many days successively on fish, crabs, oysters or muscles, which they consume indiscriminately, but they are extraordinarily fond of vegetable food, and whenever they have an opportunity of indulging their appetites in eating rice their voracity is excessive and all of them devour double the quantity that will suffice another Malay. The constant diet of fish gives their stomach an uncommon capacity, and the gentle stimulus of vegetable food is very gratifying to them. The places they occupy or have lately visited are easily known by the remnants of fish, by piles of shells, &c., and are also indicated at a great distance by a nauseous odour. Cleanliness is by no means one of their qualities. Those I observed were rarely exempt from irruptions of the skin, and several complained of diseases of the bowels.

All their occupations have relation to the element on which they live: they spend their time chiefly in fishing or in preparing fishing tackle of various kinds. The preparation and arrangement of the leaves of a species of Pandanus for sails is the business of the females. Those which have attached themselves to a particular spot have acquired some degree of industry; part of the produce of their enterprize is dried and exchanged for rice and necessaries. In the bay

of Klabbet I observed a number of small prows engaged in darting tripangs, a species of Holothuria, which being boiled and subsequently dried becomes a favourite article of diet among the Chinese and is sold with considerable advantage to individuals of that nation for the China trade. They also derive some emolument from the collection of Agar-agar, a sea weed of the Genus of Tremella, which is employed as a condiment in the food of the natives in general.

Most of the Ráyads found near the island of Bánká, have embraced the Mahomedan religion; of those in the neighbouring seas many are still infidels; but their manners, mode of life and domestic habits are less refined than those of the Malays in general. They are of a swarthy colour, their persons are well made and robust, they possess great bodily strength and are experienced in the use of those arms which form their usual defence.

Their character is by no means favorably delineated; the accounts uniformly agree in representing them as treacherous and very indifferent as to the crime of murder. They possess a considerable degree of personal courage and enterprize: qualities which are improved by their mode of life exposing them to unceasing vicissitudes and hardships.

But they employ these qualities often unlawfully to the detriment of others. If they can surprize a prow of inferior force without the probability of being discovered, the contents are plundered and every person on board put to death. Accidents have several times led to the discovery of these atrocities many years after they were committed. But piracy where they are at liberty to indulge it, is their more regular profession, and they have been too much supported by the princes and other inhabitants of Linga and Rhio, who have profited by their exploits. Advances have often been made them in money on condition of dividing with them the spoil, by which their piracies have been sanctioned and encouraged.

Intermarriages have of late not been uncommon between their females and Malays or Chinese. By marrying the daughters of their chiefs, persons of other descriptions of people have succeeded in becoming their leaders. Panglima Raman has already been mention-

ed. The village of Kampak, the principal resort of the Ráyads in Bánká, consists of those Chinese who have attached themselves by marriage to these people and live a kind of amphibious life among their new connections. Their present chief in Bánká is descended from a Chinese father who was connected with a Ráyad by matrimony, and he is again wedded to the daughter of their former chief in this neighbourhood.

Demang Minyak is in various respects the most notorious character the island of Bánká has hitherto produced. He was born at Sungie Ulu about 50 years ago, before the foundation of a regular settlement, when this place was the chief resort of the Ráyads of Bánká. In his early youth he displayed much vivacity and was engaged by a company of strolling players, who travelled, for the amusement of their countrymen, through the greatest part of the island. As he advanced in age he was noticed by the agents from Plembáng on account of his capacity, and made himself very useful by his assistance in the foundation of the settlement at Jebus: he was in consequence recommended to the court of Plembáng, and having already obtained much influence over the Ráyads by his connection with the daughter of the former chief, he was regularly appointed to their command with the title *Demang Surantakka*. He is generally known by the name of Demang Minyak; he deserves the title of *Panglima Raman* of Bánká, which, literally translated, signifies a commander of distinction, and the odium which a comparison might attach to this name is obliterated by his being lawfully employed. This man possessed in a great degree the qualities of his maternal ancestors modified by the vivacity of the Chinese; and the same qualities which would give him much capacity for mischief as a pirate, have been regulated and controlled. During a long and active life he has been usefully employed in resisting piracy, and one of his last exploits in the service of Plembáng was the defeat of Panglima Raman whom he encountered on the north side of Bánká; after being severely beaten, Panglima Raman retired to Linga where he still remains, without attempting to appear on the seas again.

Demang Minyak's latest employment has principally been to res-

train the enterprize of the pukats, for which purpose his own vessels and the prows of his Rayads are particularly adapted.

The inhabitants of the interior of Bánká, who are commonly called *mountain-people*, Orang Gunung, belong to the Malay race,* but they are far behind the Malays of the surrounding countries in an approach to civilization. Their particular derivation cannot be traced: they have, in ancient periods had no intercourse with Europeans, and very little with the neighbouring Malays. About the period of the settlement of Minto, they embraced partially the Mahomedan religion; some of them are still Cafirs or infidels. They speak the Malay language somewhat adulterated by words peculiar to themselves or derived from the Javanese language. They are distinguished in Bánká according to the territories they occupy, but have no concerted government. In each district there is a person known by the title of *Batin*, who is considered as the chief, though he possesses nothing to support authority. There is no hereditary prince or chief whose influence extends over the whole or over a considerable portion of the island, similar to that of other oriental princes. The office of Batin is of the patriarchal kind, he is looked up to as the bond of society who possesses the general confidence, and his counsel is expected, more than his assistance, in cases of difficulty. The title generally descends from father to son, but the succession is always regulated by the approbation of all the *Mattagawes* of a district, a name which designates those persons who be-

* They appear to be the same race with the various tribes of Binua inhabiting the interior of the southern part of the Malay Peninsula. Mr. Willer, who resided for five years in the country of the Battas, informs us that in all the most mountainous parts of Sumatra a comparatively rude people, called *Orang Lubu*, wander, who so much resemble the Binua of Johore as described in this Journal (vol, I. p. 242) that he has no doubt they are the same race. They speak the Malay language in a rude form. We have long doubted the descent of all the Peninsular Malays from the proper Menangkabau people, and anticipated that further research would discover the remnants of aboriginal Malayan tribes in Sumatra to whom we might refer the origin both of the Menangkabaus and of other branches. A further acquaintance with the Orang Lubu would probably afford an answer to the question whether they or the Binua of the Peninsula are the parent tribes. Believing that we can connect the Binua with more northern continental people, we must, in the mean time, consider it probable that the Orang Lubu are offshoots from them. ED.

ing married are attached to a particular territory, and are called on occasionally for the services of the sovereign. If a Batin forfeits the confidence of the community, or commits some notorious irregularity, he is discarded by the general voice, and another person is nominated in his stead. He receives no emolument or contribution of any kind, and the only advantage derived from his office is the assistance of one day's labour from all the males belonging to his district, at the period when a spot is cleared in the forest for a new rice plantation.

The mountain people form no villages: they live dispersed in single families over the whole territory of their respective districts in the midst of the forest, changing their situations every year, for the purpose of attempting a new plantation. Their manner of cultivating the ground is rude in the highest degree: a fertile spot is selected in the forest, the trees are felled, the smaller trunks and branches are employed for the enclosure, the large trees and stumps are destroyed by fire, the seed is thrown in the mould and the harvest patiently expected. Such a plantation is called a *ladang*, and here the native builds his hut. Sometimes though rarely the work is undertaken in conjunction by several families.

The only places which bear some resemblance to villages are at *Dshuwok* in the district of Kutto-waringin, a settlement lately established by the Depally Barin at Depa near the large river of Marawang, and a small hamlet between the stockade of Pangkal-penang and Juak in the territory of the Batin Marawang.

The natives of Sungie-bulu, Jebus and Klabbet, have preserved their ancient mode of life in greater purity, and in the whole of these extensive districts no villages are found.

In whatever point of view these natives are considered, their habits indicate but a small remove from the state of savages. Their culture is confined exclusively to rice, although the Chinese and Malays from Plembáng have introduced Indian corn, plantains, and Monioe, and the fertility and luxuriance of the soil strongly invite to an extension of agriculture. Even the roots of the convolvulus Battatas which are often planted on their grounds after the

harvest, are employed in barter with the neighbouring Chinese for various trifling articles of luxury, rather than for their own consumption: like most other savages they are limited to a single species of nutriment.

The most common and useful domestic fruits and trees are never found among the mountain-people, except at the villages abovementioned where several kinds have lately been planted. Many of the natives are unacquainted with the method of opening a cocoanut for the purpose of obtaining the fluid it contains. The only fruit tree which is sometimes found near their ladangs, as well as in solitary parts of the forest, is the Champedak, a species of Artocarpus or bread fruit: This tree, which grows to a very large size, is often planted by the natives, agreeably to an old eastern custom, as a legacy (pusaka) for their posterity, in the expectation that at a future period their children or grand children may clear a plantation on the same spot and discover the trees their ancestors have bequeathed to them.

The inhabitants of Báuká present on first acquaintance various good qualities, which must however be appreciated with regard to circumstances before their character is too favorably delineated. Theft and robbery are scarcely known among those of the northern portions of the island; gambling, intoxication, adultery and similar vices are equally uncommon; but the smallness of their community, the separation in which they live, and their general poverty withhold as well the incitements as the opportunities for vice.

Although they profess externally the Mahomedan religion, they have retained many of their ancient superstitions. They have a peculiar veneration for the forests which cover the island as the source from which they chiefly draw their nourishment. Every portion of a forest is in their opinion subjected to a spirit or inferior deity, and they never cut a tree, in laying out a new rice ground, without soliciting, by means of an offering, the assent of the particular divinity, that superintends the spot. By neglect of this ceremony they infallibly expect to be visited by some severe domestic calamity. As the season approaches for attempting a new plantation, some Ben-

zoin is burned near one of the largest trees of the ground they have selected, and some customary imprecations are uttered. The consent or prohibition of the Antu or Bliss (these are the common denominations of the Rustic deities) is signified to them at night: certain images or representations in their dreams during the three next succeeding nights are considered as favourable; others are looked upon as a denial, and a new spot is accordingly selected and attempted with the same ceremonies.* In cases of distress or misfortune they invoke in several districts the assistance or commiseration of a particular Antu or Dewa, called *Akke timbang* (in the same manner as the neighbouring islanders invoke Primisti Gurul) who they suppose is concealed in one of the large rivers of the island. The mountains, rocks and stones are likewise subjected to their several Antus.

Not many years ago, during the prevalence of an epidemic disease, one of the inhabitants of a certain district exposed on an elevated scaffold the body of one of his deceased relations, enclosed in a basket of network, in order that the Antu might satisfy himself on this offering and spare the rest of his relations.

The favourable qualities in the character of the mountain-people shew themselves principally in the districts of Pisang, Klabbet, Sungie-bulu, Sungie-liat, Marawang and Pangkal-penang. In the extensive tract of *Kutto-waringin*, some portions of which are more populous than the districts abovementioned, their habits have, in a great measure, been contaminated by the examples of the Lanons; here the sale of opium, which was carefully prohibited in the other districts, has also been partially permitted, during the former administration, and with other excesses, robbery and murder have sometimes been committed. The constitution of society among the mountain people was not reduced to regularity. Dshemangs [Jennángs] or agents from Plembáng, resided latterly in various parts, and these regulated most subjects of dispute according to the customs among the Malays, where every offence is expiated by a fine.

* Compare the similar Mintra superstition *ante* vol. I. p. 230.

Their domestic habits are very simple: the marriages, which are always contracted with the advice of the Batin are rarely prolific. In my enquiries concerning the population of the island I had frequent occasion to notice their slow increase. The number of children in a family rarely exceeds three, in many families there is but one child, and many marriages have no offspring. The domestic arts of spinning, weaving &c., are not known among them, and they depend for clothing on the neighbouring countries. In several districts the inhabitants, particularly the females, manufacture mats of various qualities; in which they display considerable patience and ingenuity. If we except one or two instances of persons who have visited other countries, they acquire neither reading nor writing.

These people, who to a rude simplicity partaking of stupidity, unite much sincerity of disposition which interests the stranger in their behalf, have suffered more than the other inhabitants from the calamities of the island.

Of an extensive population nine-tenths have been destroyed or dispersed through other countries by the causes above enumerated, and it has often been to the writer a very agreeable reflection, that the change of the government of Bánká has again afforded them security and protection.

THOMAS HORSFIELD.

Library, East India House,
August 5th. 1847.

[Before proceeding to Dr. Horsfield's Report we shall give an extract from Dr. Epp's *Schilderungen aus Ostindiens Archipel*,* which brings down the history of the island to a recent period, and furnishes a graphic picture of the mode of life of a Dutch official there at the present day.]

Bánká was early known to the Europeans. The strait was the common passage for vessels to China, Japan and Malacca. In the year 1668 the united Dutch East India Company took the islands of Banka and Biliton (then governed by a Sultan) under their protection. Some years afterwards they both came into possession of the Sultan of Plembang; with one of those Sultans the Dutch East India Company in the year 1777 entered into a treaty for the monopoly of the tin. This Sultan owed his election to the throne of Plembang to the Dutch. In 1811 one of his successors murdered the Dutch in a cruel manner.

The sons and princes of the Sultan were usually nominated chiefs of his different possessions. Thus the chiefs of Banka descended from Plembang, and governed the island as vassals of the Sultan with the title of Dipatti. The form of the government was originally a patriarchal one, however often degenerated into despotism; so that the people of Banka frequently experienced heavy oppressions, owing to the Dipatti's not having regular revenues, and being left to their own measures for securing their means of existence. After the occupation of Java by the English (1811) the people of Plembang shewed an inimical disposition towards the Dutch, who consisted for the greatest part of merchants, besides a small garrison, and were settled opposite Plembang in a factory. Nothing less was contemplated than their total extirpation. The Sultan deceitfully offered his aid to save them in praus and carry them to Batavia, but by the instigation of the Demang Osman (one of the Sultan's councillors) the vessels were pierced and sunk with the Dutch who were sleeping, in the Punsang (mouth of the river of Plembang). This was effected by the commanders of the praus, who took out the stoppers which closed the holes. They counted on obtaining by this infamous proceeding the approval of the English Government at Batavia, who got rid by this means of a number of troublesome prisoners of war. The latter, however, outraged at such a crime, sent an expedition against the Sultan for his punishment and deposition from the throne. Although they did not

* Heidelberg, 1841.

entirely succeed in the beginning, yet on a second expedition Plembang was taken by the Colonel Gillespie, who put the younger brother of the Sultan upon the throne, and obtained from him a cession of the island of Banka to the English, (20th. May, 1812). They gave it the name of Duke of York's island. The dethroned Sultan fled with his treasures out of the country.

In 1817, after the congress of Vienna, which restored to the Dutch their possessions in the Eastern Archipelago (1816), they took possession of Banka.

The fugitive Sultan applied to the Government of Batavia, defended himself against the accusations of being an accomplice in the murder of the Dutch in 1812, claimed back his throne, and was nominated again Sultan of Plembang in the year 1818 by the Dutch, who seemed to have been satisfied of his innocence. The younger Sultan was dethroned, but permitted to live at Plembang. He complained to the British, who at the time were still in possession of the south west coast of Sumatra (Benkulen) and solicited their assistance in maintaining his right. The English, whose protigé the Sultan was, ordered a corps of Bengalee troops to his assistance, who marched overland to Tibit-tingih, and were about to descend to Maras, when a Dutch squadron appeared in this stream and captured the British troops.

Soon after this the old Sultan began to show inimical dispositions towards the Dutch. In 1819 he suddenly one morning opened a fire against the Dutch factory from his fort which lay opposite to the latter. The Dutch got into a great dilemma. Their first expedition against Plembáng failed entirely, and the troops were forced to retreat to Muntok, on the N. W. coast of Bánká. At the same time disturbances on the east coast of Banká broke out. The Depatti Barin, a chief whose family possessed the greatest influence in Bánká under the Sultan of Plembang, was retained by the Dutch Government as Dipatti of the district of Marawang. He had engaged himself for the transport of the tin from the mines with his praus and soon considerable quantities of that metal were missed, upon which he was accused of fraudulently smuggling the tin out of the country in order with the profit to indulge his excessive passion for gaming. Summoned by the officer of the district to make his defence, he failed to appear and made an offer to the Sultan of Plembáng to expel the Europeans from Banka, if proper assistance were rendered to him, and to subject the island again to the Sultan. The latter issued a manifesto by which Barin was nominated Dipatti of Banka and the murder of all civil and military officers was ordered.

The Sultan engaged in this proclamation to pay during three years nine Spanish Dollars for every picul of tin. Whoever rejected this offer, was to be considered as an enemy. The Dipatti caused this proclamation to be affixed in every kampong, and commenced forthwith to put it in execution. At the time the Resident of Banka (Leuissard) was on his first circuit in this island. He had arrived in an English vessel at Sungie-liat, and went a few days afterwards to Pangkal-pinang. Here he received from the Commissary (Minding) the news of the failure of the Plembang expedition, and was called upon to return without delay to Muntok, the state of affairs rendering his presence at the chief place imperative.

The east coast was already in uproar and the Resident was warned not to go on his journey without a strong guard. Circumstances however were pressing, and he set out after having sent previously three of his servants on the way, whilst he himself was accompanied by 8 Coolies 1 Mandur and a servant, who carried his sword. The three servants were stopped on their way at the first kampong which was 12 miles distant from Pankal-pinang. A numerous mob assembled, armed with blunderbusses and spears. On the Resident's arrival there, the Coolies dropped the sidan and fled exclaiming, "Tuán jàgà, ada orang jáhát" (take care Sir, there are bad people.)

The Resident from the chair seized two pistols and discharged them at the rebels. One missed fire, with the other he killed his own Mandur. He threw them away amongst the bushes as of no further use, and called for his sword. The servant however was frightened and dared not give it to him. At this moment he received the first discharge from a blunderbuss in his leg. He fell but recovered again and sat down under a bush, sorrowfully shaking his head. He received subsequently some more charges into the belly, and fell over. The murderers rushed on him and with a klewang cut off his head, which they affixed to a pole and carried in triumph through the kampong. Afterwards they salted it and made one of the servants, whom they had seized, take an oath upon the Koran that he would carry the head to the Sultan of Plembang. Another servant had made his escape and brought the news of this occurence to Pangkal-pinang.

Meanwhile the Dipatti seized all those who refused participating in the revolt, beheaded them and burnt down their habitations. The military operations of the Dutch against Kutto-waringin and the east coast now commenced. They met with great difficulties arising from the want of well constructed roads, and of victuals by which the progress of the troops was retarded. The Dipatti Barin exhibited great capacities as a guerilla chief.

He and his son if pressed closely always disappeared. The impenetrable jungle offered to them a secure shelter.

In the year 1821 Plembang was taken, an event which in the history of the E. I. Archipelago will always make an epoch. By this feat also the hostile forces at Banka were scattered. The Dipatti Barin fled and it was impossible to apprehend him.

In 1826 Captain Shwend was commander at Baturussak. He strenuously tried to capture the Dipatti, whom he considered the chief source of all the disturbances. Things had advanced so far as to allow mutual visits under the promise of safe conduct. On a journey to Muntok, Captain Shewnd passed the night with the Dipatti Barin. They slept on mats close together. In the night Shewnd rose, aimed with his gun at him and pulled the trigger. The gun missed fire and the Dipatti awoke. Then Shwend aimed a blow at him with the butend of the gun which however was parried by the arm of the Dipatti. Long afterwards he showed me still the cicatrice of it and a stiff finger, declaring that he then was true to the Dutch Government otherwise he might have murdered the Captain without any obstacle. The Dipatti Barin escaped and claimed for the injury sustained 100 Spanish Dollars which were refused by Shwend, upon which Barin commenced disturbances afresh.

The Dutch sent two columns of volunteers against him, and succeeded after some time in blockading the Dipatti. At this time the Commissioner Laung arrived from Batavia at Muntok in order to investigate a certain case pending against the Commissioner's House. He ordered an armistice and entered into a treaty with the Dipatti in 1828, by which a pension was granted to the latter, on condition that he and his son should not further interfere in the internal affairs, and the promise that they would keep the peace in future. This pension was afterwards under the Resident Colonel Reede fixed at 60 guilders per mensem. He and his son Amir took the oath of allegiance to the Government.

At the time of my departure from Banka he and his son were still alive. The old Dipatti inhabited the kampong Mandara excellently suited for the erection of fortifications (8 miles above Baturussak on the river, which is commanded by the same). The Dipatti Amir founded a new kampong opposite Batturussak. The aged Dipatti stood in high esteem among the population, who moreover believed him invulnerable, since he had escaped so many dangers without injury. His arms were for the most part sold by him and his pension is spent in gambling, and he himself lives poorly. He has four wives and several children. The Dipatti Amir is a

dangerous subject and of a suspicious appearance. The old Dipatti has winning looks, and in his features has somewhat of Napolean. He received his pension in Baturussak and for this reason was on good terms with me. He often visited me when mutual presents were given, on our part of course with more liberality than on his. Now and then we made excursions to his kampong in a small boat (sampan). We departed on such occasions early in the morning from Batturussak and used our umbrellas (payongs) instead of sails, which afterwards served us as tents against the burning beams of the sun. At noon we arrived at his house, dined with him, hunted in his ladang, presented trifles to his children and returned in the evening. Then the air was soft and cool, the dark blue sky glittered with innumerable stars which were reflected by the smooth river; the dark silent forest bordering the waves was illuminated by myriads of emerald sparkles, emanating from numberless winged insects. Except the strokes of the oars, the hollow roaring of the Ludong roused from his den, or the snapping of the alligator, nothing interrupted the solenm silence. The feelings which then took possession of our minds can only be appreciated by those who have themselves witnessed the magnificence of the tropical nights in the East.

The peace of Banka has since remained undisturbed (some broils among the Chinese excepted). Civilization, however, makes its progress slowly. The produce of the tin mines increases every year. Excellent roads spread over the island which are kept constantly in good condition, though they are only practicable for foot passengers, since the bridges consist of round rugged beams, between the interstices of which the feet of the horses are easily crushed, and since the hilly country is not adapted for the use of carriages. The houses of the kampong are constructed of better materials; many Chinese places possess handsome substantial buildings, wherein the traveller finds better accommodation than in the settlements or in the jungle. Muntok itself is improving daily. The population of the island is on the increase.

The area of the island might promise a population tenfold the present number. Many a country in Europe of equal extent and less liberally endowed by nature supports above a million inhabitants. Many a tract of land at present lying waste is able to furnish the means of existence to a multitude of industrious colonists. If the soil were brought under proper culture it would become unnecessary to abandon ground once in use, and to destroy every year a fine forest to obtain room for a ladang. On the contrary the forests ought to be spared as much as possible since

they form the reservoirs of the water and prevent the drying up of the ground. It should only be cleared where it becomes injurious to health by swamps and morasses. Many a vast heath now covered by fern and wild bushes, might be cultivated and used for pasturage. By this means the natives might be released from their hard service as coolies, the roads become practicable for carriages, and the transport of goods, now carried by men, might be done by draught cattle. It is true it would be necessary to level the roads, and to provide them with substantial bridges, but the Bankanese, now employed as a beast of burden, would be enabled to spend his time in cultivating the ground ; commerce and intercourse would gain by it, and a profit ten fold higher than that from the monopoly of the tin, would be obtained for the mother country by the developement of commerce and traffic. What may become of such countries by careful cultivation may be seen in the instance of Java, which alone at present, by the produce of the most valuable articles, yields more profit to the mother country than all her other colonies.

MANNER OF LIFE OF THE EUROPEANS IN BANKA.

It may prove interesting to many of my readers to have a sketch of the life the Europeans lead in this island, for which reason I shall give an account of the life I pursued myself during a three years stay at Banka in the capacity of civil and military officer.

At Batavia I received very unsatisfactory accounts of this land. It was generally described as an unhealthy place. A great number of persons confounded it with the penal settlement Banda (in the Moluccas) and deemed the fate of the Europeans destined for that place as deplorable as the French do that of those who are sent in exile to Cayenne. The most inconsistent rumours were spread through Batavia respecting Banka. Some maintained that the water there was impregnated with tin particles so much as to tin over, as it were, the bowels of the living, and to form concretions from which the unfortunate wretches invariably perished. Others painted the country as low, swampy and burned by the beams of the sun, where one could not stay long without contracting jaundice, spleens, or at least fever. No viands were to be found, not even a cocoanut. Our notions of Banka therefore were not the most favourable, and our astonishment was unbounded at the sight of an evergreen country with the most luxuriant vegetation, and ornamented with hills, instead of a barren, melancholy and parched spot. My travelling companion shared in the amazement on hearing, after my return from Pankal-pinang, where I had landed first my

account of the pure riontels, of the palmgroves, from which Pangkal-pinang derived its name, of the fair women, and of the large fowls and cats, which I had met with.

The time of my stay at Banka was the happiest period of my life in the East Indies, and often I wished myself back in this country during my subsequent sojourn in Sumatra. Even now I remember those days with pleasure. My stay in Muntok, where the presence of the civil and military officers, the lively kampong and the delightful situation close to the Banka street, contribute towards the enjoyment of life, was but too short. I choose the eastcoast for my domicile where I lived it is true entirely isolated in that tedious place Baturussak, but independently, and in a sphere which roused my activity in the various occupations as superintendant of Marawak,—which office the first functionary of Sungie-liat and Marawang confered upon me as physician and apothecary. Being at the same time the first civil authority of that place my life was that of a petty prince. The office of president of judicature, superintendent of police, administrator of the tin mines of Marawang, overseer of the government buildings at Baturussak, superintendent of public roads, inspector of the garrison at that place and of the equipment of the coast vessels, were united in my person, and I was beloved and cherished by my Malay and Chinese subjects. The vessels arriving and departing were consigned to me. The Resident and other functionaries, on their circuit through the place, always lodged with me during the time of their stay, as did the commanders of the vessels. It was necessary for this reason to be always provided with sufficient provisions, for the purpose of exercising the hospitality which is still a virtue of this country. The supplies I received twice a year from vessels coming to anchor at this place. They consisted generally of a great quantity of Rhenish, Madeira, Cape and red French wines, ports, ale and Dutch beer, liquors, gin and seltzer-water, some casks of butter, herrings, some dozen cases with salmons, sardines, European fleshmeat, broths and preserves, hams, potatoes, province oil, &c. The country furnished venison, poultry, fishes, yamroots, melons, cucumbers, pineapples, and other fruits. Only the water was in the dry season scarce and of a bad quality, since for want of a well it must be taken from an open pit about 500 feet distant from my house.

The days during which I had guests with me, were feast days and in lived then in jubilee, notwithstanding the circumstance of seeing a great breach effected in my provisions. When the guests were departed and had left me solitary, my life was the following.

In the morning, at the beating of the drum, I used to rise and to breath in the cool air of the early hour before the open verandah of my house, after which I took a bath consisting of some buckets of water poured over my head by a servant, which is called by the Malays siram. However a bath in the river would have been better, yet I dared not venture to go into the stream for the alligators, and also for the uncleanliness of the water. This bath restored to the body its elasticity much weakened by the nightly sweat. After that I dressed, took some refreshments, and went to see my patients, then I attended to other business, and at 11 o'clock breakfasted a la fourchette. The remaining trifling affairs I concluded during the digestive process, and took at 12 o'clock my siesta, from which I usually rose again at 3 o'clock, taking then some refreshing fruits, as pineapples, oranges or any of this kind, used some lemonade mixed with wine or seltzer-water, revisited my patients, and then went a hunting until evening, when I returned, usually tired and torn, but with an excellent appetite, which latter is the best thing in the East Indies one can wish for. I then took again a bath and dined at 7 or 8 o'clock. The remainder of the evening was spent in reading, or, if I happened to have guests with me, in playing or conversing.

My house was situated in the centre of the palisaded benting, and constructed of wood. It enclosed a verandah in front, 12 feet broad, 4 apartments and a sort of drawing room, used commonly as a sitting and dining room. The front-gallery was furnished with two easy couches, the same were placed in the dining room beside a large table. The other rooms were filled with a dozen of chairs with tables, chests of drawers and bed-couches, the latter was covered with a curtain of gauze for protection against the musquitoes. Stables, lodgings for servants, kitchen, godowns and other buildings appertaining to the house were detached; each was covered with a separate roof. I had nine servants, viz., 1 cook, 1 washerman, 1 syce, 1 domestic servant, 1 employed in the dispensary, 1 gardener and 2 police peons. Besides boarding they received from 6 to 15 guilders monthly wages. It is difficult to procure good servants at Banka, and therefore advisable to take them along with you from Java, especially cooks and washermen. The latter employed by me was a Bengalee, who washed very well, but soon tore my clothes into pieces, by twisting them in the air and dashing them against a flat stone. For smoothing the linen a goose is used, filled with redhot coals, instead of an iron.

In Batavia, as in other large places, two servants are sufficient, since the different work may be done in the town. For my pleasure and profit I laid out a garden, in which, besides pisangs, pineapples and other fine tro-

pical fruits I planted European vegetables, among which beans and cucumbers prospered the best. The potatoes never arrived at their blossoming, when they reached a certain height they withered and died. The cabbage which I obtained from shoots suffered much from ringtails, against which my gardener applied the juice of certain plants, mixed with water. A single cabbage plant often costs here one guilder.

If, after a solitude of weeks and months, I experienced a deadly ennui, and neither studies, drawing nor collecting of natural curiosities proved a remedy for it, then I made an excursion into the country alone or accompanied by a servant. My passion for hunting often seduced me to penetrate into the thickest jungle, in which I a few times lost the way and was embarrassed by the breaking in of the night. Several times also snakes passed close to my head between the boughs of the trees, to which they climb with great agility. I often passed the branches of the Baturussak stream thickly covered and overhung by the bushes, in a small sampan, when neither the overturning of the boat by submerged trunks, nor the fearful proximity of the alligator frightened me back. I felt satisfied if the heart was beating in such jeopardies; only the unspeakable charms of the wilderness and its dangers could compensate me for solitude.

One morning I passed, with the English Captain Nash, up the stream in a boat in order to enjoy the prospect of Maras, which was visible in the next reach of the river gigantic, towering to the sky in the distance. The weather was fine, the fogs of the morning air covering the forest were pressed down by the pure luminous light of the sun, which cast its rays through the blue ether. The bright green of the trees was animated by monkeys which we chased as we passed along. Suddenly I perceived a black and yellow speckled snake rolled up and clinging to a forked bough which hung over our way. The boatmen tried to avoid passing close to the animal, however I desired the captain to direct the course of the boat towards the spot and discharged the contents of my gun, consisting of small shot, at the snake, which, rapidly unrolling, made a furious spring in the air, clinging with the tail to the tree and searching with flashing eyes for the enemy, while from her open mouth the blood gushed. Availing myself of this moment, I gave her a second charge, which precipitated her into the water. We caught her with a sling and triumphantly carried her home. She measured was 6 feet in length.

At another time the soldiers brought a living snake, 11 feet long, which they had caught in the kitchen, I stripped off her skin which I filled with sand and dried in the sun. The administrator of Sungie-liat who visited

me shortly afterwards, regretted much that I had not spared her life and locked her up in the godown, where she might have been of great service in destroying rats. However such a rat catcher appeared to me too horrible.

It is not advisable to have pineapples and other shrubs growing close to the the house, since they attract vermin of the above description. The place close before the house ought therefore to be kept clean and stripped of every plant. In the fissures of old wood centipedes and scorpions frequently nestle, of which the large black ones are less dangerous from their size by which they are easily discoverd; the small yellow ones however cause painful bites, which I myself experienced several times. I was also bitten by a centipede when carelessly in the morning wiping myself with a towel, in the folds of which this loathsome animal lay hid. Clothes and shoes ought therefore to be carefully searched before putting them on. The black scorpions are of the size of large river crawfish.

The lizards covering the walls of the room are also alarming to the newly arrived European in the beginning. The gekko especially is generally feared and believed to be poisonous. It is maintained that if it accidentally comes in contact with the human skin, it will cling to it with such obstinacy as to suffer itself to be torn into pieces rather than let go its hold. It clings tightly to the smoothest ceiling with its humid warty toes. In shape it resembles the salamander. Its cry is similar to the sound of its name, which may be heard often all night long.

The small lizards inhabiting the houses and rooms are held in much favour, since they destroy the insects and no body ever thinks of killing them.

Here I shall describe the manner by which the alligators are caught by the Chinese. This is effected either by means of a strong iron hook to which the bait is affixed, or of a piece of wood one foot long, pointed at both ends and connected with a chain or strong rope, tied round its middle. The one end of the wood is slightly fastened to the chain, so that the wood itself lies in the same line with the former; to the other end a piece of flesh is stuck, and the whole is laid on the shore with the chain fastened to a pole driven into the ground. The alligator emerges from the water, swallows the wood along with the flesh, and retreats into the water. By swallowing the bait the end of the wood which was loosely fastened to the chain is disengaged, and assuming the form of a T across the throat, sticks there, so that the alligator cannot relieve himself from it.

Baturussak was closely surrounded by the forest which was only cut down to the extent of 400 paces in diameter. On this spot the grass and shrubs had sprung up to the height of a man. On my arrival there, I ordered them

to be cut down and the whole to be burned, by which means I obtained a fine meadow, which attracted every night the deer which I shot from my doors.

The chase, for want of better amusement, was my only pleasure. However our East Indian comrades are by no means worshippers of the sport, and the song

" Es lebe was auf Erden
" Stolzirt in gruner Pracht
" Die Felder und die Walder
" Die Jager und die Jagd"

is heard only emanating from the languid throats of those companions stretched on an easy coach or reposing in an arm-chair with the legs across the table or on the railing of the verandah and a full bowl before them. They have an antipathy against all motion and activity, and deem an excursion performed in a sedan a strenuous exertion.

I knew an excellent person who had lived during 21 years in Banka, and was an useful functionary, but who never could be prevailed upon to take more exercise than a walk in the evening at 5 o'clock round the precincts of his habitation, with which, tired and exhausted, he closed his promenade. In this aversion against every exertion of the body, generally all those participate who live for a long time in the East Indies. It should not however be imagined that life is spent entirely in inactivity. Strict performance of official duties is expected from every one, whatever rank he holds, and an active emulation is nourished by the intriguing rivalry of the civil, and the ambition of the military, officers. Though the heat during the day time renders it almost impossible to remain in the open air, yet it is less troublesome in the habitations provided with spacious verandahs, sufficiently keeping back the beams of the sun, and freely admitting the draught of air; the total relaxation of the body which we often experience in Europe during the hot days of July is unknown in this country. Officials, merchants and private persons perform in their offices proportionately the same amount of business which is usually done in Europe.

In the large towns the hours of leisure are spent either in the company of some friends or in the same manner as in Europe. In detached and isolated places life is spent in a familiar way with the few colleagues more or less agreeable, according to the character of the individuals who are thrown in our way. Although in Muntok a society has been founded yet little circles of friends are frequently formed where general joy and cheerfulness reign. Such parties were given by turns, and every host tried his

best to entertain his company. On Sundays there was usually a great assembly at the Residents, where all the civil and military officers appeared.

The table of an East Indian gourmand displays a great variety of dishes and the produce of all the four quarters of the globe is represented. The native food however is the best for the European who has overcome the difficulties arising from the change of climate. It consists chiefly of rice, fowls and fish. The rice is boiled, the water afterwards thrown away and the dry rice is taken with curry made of fowls or fishes, and mixed with various ingredients, viz., spanish pepper, curcuma, aignous, drassi, ground cocoanuts, &c. The natives carry the meat with their fingers to the mouth, which they do with great dexterity by using the fisrt, the little and the ring-finger. The Chinese eat with two sticks and are not behind the Malays in dexterity. The Europeans generally have a blue or green hemispherical glass before them on the table, filled with water and some leaves of the orange tree, for washing the hands during dinner. The Chinese are seated round the table like the Europeans, the native sits down on the ground covered with mats. It is strange that in this country where the coffee grows, the latter is not used to a greater extent. Chinese and Malays usually take tea.

For a stimulus to the stomach, strong spices are used, which burn the mouth of the European not accustomed to them. They consist chiefly of Spanish pepper either whole (Lembok) or ground (Sambal) or preserved in vinegar. The dishes are numerous, and are ingeniously arranged on the table by the Malay servants. The enormous quantity of food set on the table is alone sufficient to satisfy the hunger. Among the natives a strange habit prevails of expressing their gratification during dinner, which they do by loudly smacking their lips and by belching, laying the hand at the same time on the stomach. They have no idea that an European can find such behaviour disgusting. However, we must testify to their having generally a good sense of decency, and often they may be heard saying, if an Europeans takes improper liberties, " ini orang kurang adjar," (this person has been defectively taught.)

The dress of the Europeans is light and easy in accordance with the climate. A white jacket and pantaloons and a straw hat are sufficient for appearance in the public. In populous places however great luxury is indulged in, and the European, notwithstanding the climate, parades in cloth. If business is concluded, the clothes are stripped off at home, and the person is covered only with an easy shirt (kabaya), and with wide pantaloons (tjelana tidor) which is the common undress.

A GENERAL VIEW OF WHAT ARE REGARDED BY THE CHINESE AS OBJECTS OF WORSHIP.

By the Revd. ALEXANDER STRONACH.

THROUGHOUT the empire of China some vague idea is entertained by the people of the existence of one great being, whom they designate as Shang-ti,—the Supreme Ruler,—the Supreme Sovereign, or whom they call T'ien, Heaven; and believe that he, by a fixed destiny, controls all the affairs of men. The learned among the Chinese speak of him,—as he is represented in their most ancient classics,—as having no form, nor sound, nor savour, nor tangibility; and to their minds he appears divested of all distinct personality. They do not regard this sublime being as properly the creator of the universe, nor as possessed of the attributes of eternal, and independent existence; but merely as a vast, all controlling power, the producer, and the disposer of all things. The work of creation, or of "*the evolving of the heavens and the earth,*" they ascribe to the first *man*, whom they call P'wan Koo: yet he is never regarded as an object of worship.

In very ancient times idolatry was unknown in China. But as age succeeded age the ideas of men concerning God became more and more darkened, until idolatry became universally prevalent. And now the people generally conceive of Shang ti, T'ien, or, T'ien Kung,—heaven's Lord, as residing far, far above, enshrined and secluded amidst his unapproachable majesty. Their ideas of him are mere amplifications of those which they entertain regarding the Emperor. They believe also that the supreme being employs a host of spiritual ministers, of various ranks, just as the Chinese Emperor has his ministers, or officiating rulers of every grade, set over the various provinces, and attending to the complicated affairs of the empire.

These spiritual ministers of heaven they call Shin,—expansive spirits, or Shin ming,—illustrious spiritual beings. They divide them into the two large classes of T'ien shin,—heavenly, or superior

spiritual ministers, and Ti k'i,—earthly, or inferior ones. These shin are the objects whom the Chinese universally worship.

They rarely build any temple for the worship of Shang ti; there is not one such temple in Amoy, and only one has been erected in the large city of Chiang Chow.

Still the people universally pay to heaven, or to heaven's lord, a sort of heartless homage daily. Every Chinese house has a lantern suspended outside the street door, and directly over the middle of the door way, which they call T'ien kung tâng,—heaven's lord's lantern, or simply T'ien tâng, heaven's lantern. These lanterns are all lighted up, and incense is burnt for him, during a short time every evening.

Also one day in every year they profess to devote to his honour—the 9th day of their 1st month,—which they call his birth day! Then they have plays acted to please him! They spread out tables also, and load them with cooked meats and cakes and fruits, and have pigs and goats killed and placed, whole and raw, on frames besides those tables.

With this meagre outward homage paid to heaven the people rest quite satisfied. They never think it is their duty to worship God in the spirit; nor of regarding, in any way, his authority over them.

But to Shang ti's supposed spiritual ministers, the innumerable shin, they erect very many temples throughout the whole land; and to the images they make of these shin they render perpetual worship. The people generally are well aware that the images are merely the work of man's hand; and before they are consecrated, they regard them simply as toys. But after an image has become sacred by the performance of certain ceremonies, they believe that the idol, or shin, has taken possession of it, and that then it should be regarded as a proper object of worship. These ceremonies are performed by Taouist priest,—the Bhudist priests being considered incapable of performing them. After a particular image has been got, and set up in its place, a table is covered with food, candles are lighted, and incense sticks are burnt,—the priest meanwhile audibly reciting the set number of prayers: he then takes a pencil, and with the blood

of a full grown fowl places a red mark between the eyes of the image. All this being done, it is supposed by the people that one of the Shin has entered into the image; and then incense, and offerings, and prayers are presented to it.

Nevertheless the Shin are believed to be sometimes absent from their images; and therefore where worshippers come with large offerings to their temples, bells are rung, drums are beat, and gongs are sounded, in order to call them to be present to receive the offerings, and attend to the requests or the demands of their worshippers.

As the people conceive of the Shin, or spiritual ministers of Shang-ti as invested with characters and dispositions similar to those displayed by the mandarins of the Emperor, they believe that their displeasure may be averted, and that they may become inclined to hear their petitions, by their offering to them liberal presents, and procuring plays, representing the manners of former dynasties, to be acted before them. Hence have originated the specific characteristics of idolatrous worship in China.

In times of extreme drought, the suffering people resort in crowds to the temples of those idols which are considered the most powerful and efficient; and, after clothing the images in old coarse attires, they bring them out of their temples and expose them to the rays of the burning sun, in order that—while the people are all there kneeling before them,—they may be constrained to supplicate their high sovereign, Shang ti, to send down rain upon the thirsty ground.

Near the close of every year, on the 24th day of the 12th month, all the Shin are believed to go up to the court of heaven, to render to Shang ti, an account for the past year of the state of the affairs under their charge: and on that day offerings are presented, and incense is burnt, to honour them on their departure.

On the 4th day of the 1st month of the new year they are believed to come down to earth again; and crackers are fired off, and incense and offerings are presented, to welcome them on their return.

Yet the Chinese generally place entire confidence in the efficacy of their idol worship, notwithstanding its earth—born and utterly worthless character!

Here then we behold a widely extended nation of immortal beings manifestly showing that the true God "is not in all their thoughts." The living God, to whom they owe all they possess, and in whom they "live, and move, and have their being," is to their minds as if he had no existence; and never is he spontaneously inquired after by any individual of the vast population of this so called "celestial empire."

These facts are deeply humbling to the foolish pride of man: but they should also excite in all who know the truth an irrepressible zeal to promote the speedy diffusion over this gloomily dark land of "the light of the knowledge of the glory of God in the face of Jesus Christ."

Amoy, China;
April 15*th.* 1848.

ALEXANDER STRONACH.

MEMOIRS OF MALAYS.

In Malayan villages on the sea coast or on rivers, as we pursue our enquiries into the personal history of different families, we are often struck with the evidences which they furnish of a wandering disposition in the race. But it very often happens that many of the migrations which we can trace in the lives of the older villagers are attributable not to a love of change, but to the political and social condition of the Archipelago. The prevalence of slavery, and the arbitrary power which rulers and men of rank or influence possess in a greater or less degree, are constantly forcing individuals from their native countries. The suppression of slavery would go far to suppress piracy, of which it is the principal incentive. We may destroy piratical boats and Lanun forts, but so long as every river in the Archipelago remains a slave mart piracy will continue.

What has England done to put an end to the cruelties and miseries which, directly and indirectly, are caused by slavery in the Archipelago? Page upon page of indignation has been published against the short comings of other nations, but what are the labours for humanity and civilization to which we can point as an evidence of the earnestness of our commiseration for the oppressed and the suffering, and of our right to condemn the unfeeling indifference of others? Holland may have undertaken a work beyond her power, and a sense of this may render her too selfishly conservative, but in that part of the Archipelago which, for the last quarter of a century, has been subject to our exclusive influence, and with which no other European power has even sought to interfere—the Malay Peninsula—we have abandoned the people to all the evils with which native institutions, native wars, and frequent anarchy are attended. Our moral influence has been and is absolute here. Have we ever engaged the Malay chiefs to abolish slavery, to ameliorate those institutions which bear most heavily on the liberty and industry of the people, to recognize the fact that the aborigines are entitled to protection and justice as much as their other subjects? The age for pure Malay institutions has passed away. Their work is ended. They

now serve only to harden the hearts, corrupt the passions, and strengthen the hands of royal and noble families, which keep the people in a state of insecurity with respect both to personal liberty and to industry. We might have said that the age for Malay governments has passed away. It certainly has, and we should rejoice to see the whole Peninsula under European government, as most of it would have been long ago, by the desire of its chiefs, if the policy of our Indian government had not prevented it. We have much sympathy for the people of the Peninsula, very little for the best of their rulers, and none for the greater number of them. If England will not take upon herself the burden of government, even when the rájás entreat her to do so, she ought at least to remember that wherever she can legitimately use her influence with despotic and noxious native governments, for the amelioration of the condition of the people, it is her duty to do so. We shall return to this subject.

With a view to illustrate the operation of the institutions and customs of the Archipelago, as well as to convey a more familiar view of the present state of society in it, we propose from time to time to give short narratives of the lives of individuals written down from their own mouths. The reader must make allowance for occasional exaggeration.

I.

CHE SOLIMAN'S NARRATION.

I was born in Tliwáng in the kingdom of Sámbáwá. My father Pangáwá (called by the Malays Jinnáng) Pleisá was of Bugís descent, and my mother Rám'á was a pure Sámbáwánese. They had a large family. All were daughters except Oré my elder brother and myself. Their names were Miriám, Másiá, Sítí, Sárá, Sílám, Minássí, and Seíná. My father also had three concubines, but had only two children by one of them, Hámzá and Biseh. When I was still a boy my father asked leave of Rádín Diántí Désá, who governs Tliwáng, to go to Tánáh Bugís (Bugís-land) to visit the descendents of his grandfather who live there. Permission was given, a *prahu pidéwá* was purchased, and we embarked, 37 persons in all, and

proceeded first to Lábuán Chéri in Sássák (Lombok) to take in a cargo of cotton. We next went to Sugian to meet a number of Bugís Nakhodas whose praus were about to sail for Tánáh Bugís. It was decreed however that my father should die before them for they were not quite ready to leave, and he would not wait for them, but sailed alone. On the second day we touched at Tomborá, took in wood and water, and proceeded. Next morning, when still in the Láut Tomborá (Tomborá Sea) and near Pulo Setondá, we saw a fleet of seventeen práhus, which bore down upon us, beating gongs and shouting. Five of them neared us, threw off their kájángs, and fired, killing our steersman Lánté, a Bugís. Dálé, a Mandár man, took his place, and we endeavoured to escape. My father thought the wind would enable us to leave them behind, and therefore, not to irritate them, refrained from returning their fire. When they had thrice fired, my father, seeing that they were nearing us and having prayed, (báchá sláwát,) returned their fire. The fight was continued a long time until our mast was broken, and only sixteen out of the thirty seven left alive. My father proposed to cut a hole in the prahu and sink with it, but the other survivors said they would continue the fight in the hope of drifting ashore, as we were now near it. Six other men fell, and shortly after my father was killed, when further resistance was abandoned, and the pirates took possession of the prahu. They seized and bound the survivors, carried them on board of their prahus, and fastened their feet in stocks. I was carried with one of them to one of the prahus. They then removed all articles of any value from my father's prahu, and, setting fire to the cotton, cut it adrift. Next day they were about to made sail for Sássák, when two ships and a schooner appeared to the westward, which caused them great trepidation. They immediately weighed anchor and sailed for Tánáh Milálá. Here they anchored. At this time a prahu of the Rájá of Bunáratté, Dyang Mágássing, who was proceeding with his family to Boni, had also anchored, but, the wind being very strong, its cable would not hold, and it was stranded amongst the rocks of Milálá. The females and children were all carried on shore, and Dyang Mágássing re-

turned to the prahu, and then came in his skochi to the pirates to ask assistance, which they promised to send. He got into his skochi and pulled off towards his prahu when the pirates fired at him. He got on board in safety however, and returned their fire with such effect that they thought it best to weigh anchor and proceed to Tánjong Tinggárong. On reaching it they went ashore to bathe and amuse themselves. Thence they sailed to Bangkállána where they sold and bartered a considerable quantity of the booty which they had collected. Here my comrade was sold, and I, not wishing to be separated from him, asked to be sold also. This they refused, and I and another of our crew, named Mirjám, were carried to their country, which proved to be the great river Káháyán.* I fell to the lot of one of them named Pangjáhán, who took me to his house at Mentángí where I lived as his slave for many years. I was treated with kindness, and my labour was not severe. I assisted in making ládángs, planting and reaping paddy, and all other work. The greatest evil of my condition and that of my Mahomedan fellow slaves, for there were several in the house, was that no attention was paid to our religious scruples. At whatever hour food was required, and whatever it consisted of, we had to cook it.

The chief occupation of the Káháyáns or Biáju is the cultivation of paddy. They are not acquainted with the *sáwá* or wet cultivation, and consequently have to cut down the forest to form new *ládángs* every second, third or fourth year according to the fertility of the ground. For moist ground they form small nurseries on the sides of streams by laying trunks of trees together and placing large pieces of bark over them. On this they put earth to a sufficient depth, and throw the paddy seed over the surface. The whole is shaded by a roof of leaves. When they have fixed on a place for a new ládáng, they give a feast and watch the birds of omen—the láng, ántáng, tinnáng, pántés, papáu and bekáká. The flight of the láng is most consulted. If its feelings are pleasant it sails gently and easily overhead, and the omen is favorable. If its flight be rapid or irregular,

* The same river which Dr. Schwaner lately ascended. See Miscellaneous Notices &c., p. xvi.

denoting agitation, the omen is bad. The cries of the other birds furnish omens. They have all two kinds of cries, a good and a bad; the first, if heard on the right, is a decided omen favorable to the undertaking in view,—if heard on the left, it is uncertain. The bad cry heard on the left is decidedly unfavorable, and the undertaking is abandoned. When heard on the right, it is uncertain. A favorable omen, whether of flight or cry, having been obtained, they proceed at any time afterwards when they find it convenient, to commence the ládáng. First, however, they make a small hut in the centre of the ground *(pusát ládáng*, navel of the ládáng) in which they place *tippong táwár*, *dáun sáwáng*, and *dáun bulo*, and burn *káyu ghára*, repeating invocations to the *hántu* or spirit of the spot, asking his permission to fell the forest, and his favour for the crop. They return next day, and commence cutting down the jungle. When it has lain on the ground for two months they burn it. They then bring the young paddy plants from the nursery to the hut, or for dry ground a basket of paddy, repeat their invocations to the hántu, supplicate the ántángs for a good omen, cover the paddy with leaves of the *sáwáng* and sprinkle over it tippong táwár, and then plant or sow it around the *pusát ládáng*. The males present break up the dry ground with sticks, and the females scatter the paddy over it. The crop is thrice weeded, and, when it is ripe, they, like the Malays, gather the grain by the hand with the aid of the tué. The first handful of grain that is plucked is carried to the side of the nearest stream, where it is tied to the upper extremity of a stick which is stuck in the ground. This is done to let the *smángat páddí* see itself reflected in the water, and enjoy its coolness. They return to the field and gather a considerable quantity of the *páddi muda* (young paddy) which they carry home, husk it, and give a feast.

When the harvest is finished and all the paddy has been stored in the lumbong párei (állang pádi *Mal.)* every one thinks of what he will do next. Some remain idle at home, others go into the jungle to collect káyu ghára and rattans, others seek for gold, others go into the interior or to sea to collect heads, slaves and

booty. Their only weapons on land are the sumpitan and the mándan, a kind of sword with which they cut off heads.

Their food is the same as that of Malays, but they also eat animals which are forbidden to Malays, such as hogs, monkeys, rats, snakes &c. The favorite and chief food is the domestic hog.

The men use the *cháwát*, a piece of cloth about 18 feet long;* they also wear jackets, and headkerchiefs. They are very fond of cloths partly woven of gold thread, and of bracelets with which the forearm is covered from the wrist to a little below the elbow. Their ears have large holes in which they place large rings. Their bodies are tattooed with ink. They can only do a little at a time as the pain is great and induces fever which lasts for some days. After a successful foray or decapitating excursion, the men who have been engaged in it have more figures stamped on their bodies.

They live in much dread of the Dáyá Párí, a savage tribe who live in the interior. They are very bold, strong and ferocious, and often make sudden descents to get heads. They have tails which project about a fingers length and are rigid, so that they cannot sit on their hams, but are obliged to lie or sit leaning on one side.

When a man, either in person, or through his parents as generally happens when he is young, is a suitor for a wife, there is much negotiation respecting the bálánjá, or goods which are presented to her parents under the name of marriage expences. They consist of slaves, hogs, rice, mats, pillows, curtains, bracelets &c. Even after the bride's parents have agreed to accept what is offered, the match is liable to be broken off, because on the day when the bálánjá are brought, all the relatives of the bride assemble at her house, and have a right to give their opinion as to their sufficiency. Angry discussions sometimes arise, ending in quarrels and even bloodshed.

If the bálánjá is received, the marriage is celebrated a day or two afterwards at the bride's house. The relatives and acquaintances of both parties are invited to the feast. A man in authority officiates. The bridegroom and bride are seated before him on gongs, or, if their

* *Ante* vol. I. p. 202.

families are wealthy, on blángás. He then takes a cock and a hen, cuts their throats with a knife, and lets the blood fall into a cup in which he also places the bloody knife. Having dipped his fingers in the mingled blood, he touches first the bride's and then the bridegroom's forehead, and so in succession different parts of their persons from the head to the foot, chanting all the time certain forms. When the feet have been marked with the blood, the ceremony is completed. A great feast follows, during the excitement of which, if the parties can afford it, a slave is sometimes killed. On the earth which is soaked with his blood a large pot of boiled rice is emptied. This is mixed with the bloody earth, and the men rush forward crying out " If you are a man, eat! if you are a man, eat!" till the whole has been devoured.

Common people are buried, but men of rank or wealth are burned as in Bálí. The half burned bones and ashes are gathered up and placed in a small wooden house on high poles like a rumá perpátí (pigeon house). Slaves are killed, in order that they may follow the deceased and attend upon him. Before they are killed the relatives who surround them enjoin them to take great care of their master when they join him, to watch and shamp oo him when he is indisposed, to be always near him, and to obey all his behests. The female relatives of the deceased then take a spear and slightly wound the victims, after which the males spear them to death.

About ten years ago Sirip Zín, a Pángéran of Pontíáná, who was then settled at Sámpet, where he had married four wives, visited Mentangí, and, conceiving a liking for me, told Pángjáhán that I was a relative of his, and that he wished to carry me with him to Sámpet. Pángjáhán consented, and I accompanied him on his return. Sirip Zín was exceedingly kind to me and gave me a wife. When I had lived at Sámpet for several years I heard that my sister Maríam had been carried away by pirates about the time of the rain of ashes [the eruption of Tamboro in 1815] and sold at Rhio, where she was living. I sent her a letter by a prahu that was proceeding to Rhio, and some time afterwards I received a reply from her requesting me to come to Rhio. Sirip Zín would not let me go at that

time, but next year allowed me to go away in a Chinese chimpalun. I found my sister was living with Jurágán Che Musá commander of a kruis (gun-boat). She related to me that by the rain of ashes the rice and all other crops were destroyed in Sámbáwá, and thousands died of famine. At this time many of the chiefs seized persons and bartered them to the Nákhodás of trading prahus for a little rice. Déá Sángí took my sisters Máríám and Másíá and my cousin Típá, and gave them to a Bugís Nákhodá in exchange for a picul of rice. The Bugís brought them to Rhio where he sold Máríám and Típá for twenty five dollars each to the To Bander and carried Másíá to Kotá Ríngin. The Bander made over Típá to his younger brother and kept my sister in his house. After living some years with him he sold her to Che Kássím one of his Mátá-mátás. Several years afterwards he left the To Bander's employment and went on a trading voyage to Jává, and did not return. After he had continued absent for three years without making any provision for Máríám, Che Musá, the Jurágán of one of the kruis (gun-boats), asked her from the To Bander, who said he might take her, but the Mátá-mátá not having paid her price, 25 dollars, but made it a debt, the Jurágán would have to discharge it. This he did, and Máríám became his wife. When I arrived at Rhio they had six children I had promised to return to Sámpet, but my sister persuaded me to remain at Rhio where she found a wife for me. I remained at Rhio for three years, engaging in trade, and, latterly collecting gittá tában at Tonkál, Indragirí and other places along the neighbouring coast of Sumatra. Mr. K. and other merchants of Rhio who employed me allowed me eight dollars per picul, and I purchased it at prices varying from five to seven dollars from the *Orang Láut*, who are almost entirely occupied at present in collecting gittá. During my absence at Rochor a relative of the Iám Tuán Mudá named Unku Haji wished to take my wife, her mother and sisters into his house, on the plea that a debt of her mother to his sister Unku Putri, lately deceased, had not been paid. My mother in law represented that Unku Putri had long ago freed her from this debt, but the Unku Haji ordered them to remove without delay to his house. Seeing that he was determined to resort to force, they got

a sampan at night and fled to Singapore. On my return to Rhio I found my house empty. The Unku Hají sent for me and accused me of having carried away my wife and her family, but I satisfied him that they had left without my knowledge. Shortly afterwards I followed them to Singapore.

My cousin Típá lived with the To Bander's younger brother until his death. She then married Che Abu by whom she had three children. She continued however to reside in the Bander's house until his death, when she became the inheritance of one of his sons called Haji Bráhím or To Kayo Mudá. On Che Abu's death she married Che Amát, who some time afterwards went to Bálí. He returned by Lingá where he took another wife, and Típá on this account refused to return to him. She afterwards married Che Jenál her present husband. A few months ago Haji Bráhím ordered her eldest daughter to accompany her uncle Che Su to Lingá. To this Típá was averse, and, to prevent her daughter being carried away, removed at night to Singapore, where she was afterwards joined by her husband who had been absent at Jemájá.

Singapore,
31*st. May*, 1848.

THE GEOGRAPHICAL GROUP OF BORNEO.*

CHAP. I.

GENERAL CONSIDERATIONS ON THE ISLAND.

THE exaggerated relations which were promulgated during the first years of the 16th century respecting the immense richness of the soil of Borneo, attracted to this country the attention of easily excitable imaginations; they pleased themselves in prognosticating to enterprizing men that this *el dorado* of Malasia would speedily enrich the nation which should have the good fortune to establish itself on this island. The adventurous navigators of the time promised themselves the most splendid success, and foresaw already the most beautiful prospects of amassing in a little time a brilliant fortune; they presumed that to attain it the crews of their ships had only to lay them alongside of the coasts famous for the richness of their products; that gold and diamonds were found almost at the surface of the ground; and that the natives offered a rich prey from the quantity of ornaments of this precious metal with which they supposed them to be abundantly provided. It was the office of time to render all these fine projects abortive. These dreams of an ardent imagination only issued in grave mistakes. Thus were seen to disappear from these seas, the flags of nations which had tried to fix themselves on Borneo, or in some of the islands in the neighbourhood of this great country. Holland, and, after her, England, guided by a commercial principle less adventurous and more solid, found the means of forming establishments on the principal island and took possession of surrounding islands; there they founded factories to serve as points of reunion, at which their ships of commerce could find protection and succour in their navigation of the seas of China and Japan, then very uncertain and exposed to many dangers. The Company of the Dutch Indies owed

* From *Temminck's Coup-d'Oeil General sur les Possessions Neerlandaises dans l'Inde Archipelagique*, vol. II. See vol. I. p. 129 of this Journal.

their first success in the Malayan seas *to plans laid with genius and prudence, and to the large and bold views of colonization which animated the Dutch merchants of the period.* The possessions of Netherlands on Borneo date from this memorable epoch in the annals both of its merchant and naval marine; its flag commanded the respect of its rivals in the Archipelago, rivals who only endeavoured to establish themselves in one or two islands where our courageous marine had not deemed it for their interest to plant a staff. Circumstances were long favourable to the Company, as well as to the maintenance of its exclusive commerce in other parts of the Archipelago. This caused it to lose sight of and neglect the means and resources which its factories on the west coast of Borneo would have offered in the interior of the country, if their relations had been more attended to; it was averse to maintain the necessary force and be at the requisite expence for the maintenance of its administration in a country of which the products, the territorial extent, and the physical constitution were not of a nature to furnish prompt and profitable results to its system of monopoly; hence its administration assumed a stationary attitude on these shores. When, at the close of numerous reverses and successive mistakes, this Company marched with precipitate steps towards its decline, it lacked the means of continuing a work above its power. It had to resolve to abandon in succession the actual occupation of the greater number of its factories on Borneo. *The English Company, incessantly on the watch to turn to its profit the faults committed by its rivals, and its commerce always ready to profit with energy and determination from the torpor and irresolution of other commercial nations,* made many efforts to establish itself on the shores of this great land and on the islands situated to the north; but circumstances were not more favorable to it, and it abandoned these new acquisitions a short time after their occupation. The incessant jealousies amongst the princes of the country, their quarrels and the mishaps which followed, made them resolve to claim anew the assistance of their old allies. The Dutch Company again took possession of its establishments on the western, southern and eastern shores; after that time they were ne-

glected or only preserved with a political view; during the English occupation, the government of British India did not occupy itself in a greater degree with the interests of Borneo. On the revival of the Dutch power in the Indian Archipelago, it applied itself with more aim and energy to the condition of the natives; the conduct of the princes was better watched, and more direct measures were taken against piracy; but government saw its attention too often turned away from Borneo by the events which took place in Java and Sumatra, and the ill-assured condition of its finances obliged it to postpone to another time the accomplishment of its designs. At the present day when our power is firmly established in both of these islands, it can devote all its care to the extension to Borneo of the enjoyment of that active protection which it bestows on its other possessions in Malasia. The new administrative measures, as well as the efficacious repression of piracy in the seas between Borneo and Celebes, will have for their effect the amelioration of the lot of the inhabitants of these islands.

This summary is sufficient to give a superficial idea of the opinion which has prevailed until now of Borneo. We shall devote the rest of this chapter to the development of some general ideas respecting this island, while in the following chapters we intend to furnish a more circumstantial relation of remarkable events which have happened in Borneo, and more particularly of those which are connected with the interests of the present epoch.

Borneo is divided by the equator into two unequal and extended parts, of which the southern is the larger. This island is the greatest on the globe after that new world, surrounded on all sides by the ocean, which is named New Holland. If we comprise the numerous archipelagoes by which the great land is environed, this group may be said to occupy more than eleven degrees of longitude and about ten of latitude. The geographical position of the principal island is between 7° N. L. and 4° 20' S. L. and between 106° 40' and 116° 45 E. Lon. Its length from north to south will be about 300 leagues and its breadth varying from 250 to 150 leagues. Its

superficies has been estimated at 13,342 square geographical leagues; the more exact calculation which Mr. Melvill de Carnbee has published in Le Moniteur des Indes* gives Borneo a surface of 12,743 square leagues or 6,992 myriametres; which makes it 2,589 myriametres greater than Sumatra, and 5,723 myriametres greater than Java.

According to Rienzi, the islanders give to their country the name of Pulo Kalamantan; while Hamilton pretends that Varouni should be the name; this is, says he, a derivative from the Sanscrit Varani (born of the sea,) seeing that it is incontestible that many islands, once isolated, form at present part of the coast, and that they have been united to Borneo by the deposit which the rivers bear down and accumulate at their mouths.

Mr. S. Müller tells us that the Malay name of Borneo is derived from the Sanscrit *Bhurni*, that is to say *land*, or *country*. Pigafetta is the first writer who has made mention of a city on the north of the island, which he designates Burné. Ramusio, a Venetian author who wrote in 1554, uses the name Bornei, and later Barbosa wrote Burnei; we did not begin to use the name Borneo as applied to the whole extent of the island until towards the commencement of the seventeenth century, although the northern part had been previously known under the name of Boerni, now Bruni, Brauni or Borneo Proper.

Old documents make known to us that the Portuguese Lorenzo de Gomez was the first of the [European] navigators who approached the northern part of this island; he arrived in 1518 in the ship St. Sebastien on his route to China. We presume that he gave to the country the name of Burni, but he says that the natives term it Braunai or Brauni. The travellers who have recently penetrated into different parts of the interior, the Dutch Major Muller, Colonel Henrici, the members of our scientific commission, Diard, S. Müller and Korthals, as well as the Englishman Brooke, assure us that the Dayaks which form the aboriginal population of Borneo, do not

* See *ante* p. 176.

use, and cannot even have any idea of a specific name appropriated to the whole extent of a country, of which the sea bord is even most often unknown to the savage and wandering tribes who are separated by great distances from each other, and who are dispersed in hordes of small numbers over the vast extent of one of the largest islands in the world. These different tribes are designated amongst themselves by the names which they give to the rivers on the borders of which they have established their abodes; it is thus that all the Dayaks of the great river Duson (the Banjer of our maps) call themselves *Orang Duson* (men of Duson) and those of the river Sampit, *Orang Sampit;* the manuscript memoirs of Major G. Muller and of Colonel de Henrici make mention of a great number of tribes designated by the names of rivers which have their mouths on the western coast; in the north of Borneo Mr. Brooke makes mention of Dayak tribes under the names of Sarebus, Sakarran, Lundu, Sibnuw &c. established on the rivers which bear those names.

It appears that all those tribes which at present inhabit the borders of the numerous rivers which bear their abundant waters in all directions to the coast, as well as those which are disemminated through the elevated part of the interior from whence those immense bodies of water flow down, draw their origin from one common stock, and that this aboriginal people were spread over all parts of the island before the epoch of the occupation of the coasts by the Malays. These nomadic conquerors have, without doubt, given the name of Dayak to these aboriginal people, of manners soft and peaceable, whom they have easily succeeded in driving from the coasts which they have occupied at their expence, and over whom they have, since that time, exercised an arbitrary and tyrannical domination. After having abandoned all parts of the coast of their island to these perfidious adventurers, now their masters and their oppressors, the aborigines were constrained to seek a refuge in the least accessible parts of the interior; there they have since led a miserable life, full of privations, even depending on the caprice of the Mahomedan chiefs of the coast for all that appertains to their first necessities, such as salt, clothes and household utensils, of which the Malays can entirely deprive

them, when they refuse to submit to the exactions and the rapacity of these barbarous rulers.

The coasts and a portion of the interior of this island are divided at present into states more or less independent, which are governed by Malay chiefs whose principal avocation is piracy, and who, as we shall see, oppress in the most inhuman manner, the inoffensive Dayak population established within the circuit of their dominion. The trading ships of Europeans nations, like the coasting vessels of the people of India, dread the vicinity of the coast of many parts of this island, particularly the north and the east, along which they are exposed to all the perfidy of the chiefs, masters of the coast, and where they are in danger of falling into the power of the piratical vessels which infest the latitudes of the islands of Sulu and Celebes: these freebooters are always certain of finding support and protection from the independent princes, who themselves often take an active part in these robberies. The interior, or rather the countries in the centre of the island, have not yet been explored by intelligent travellers, in whose relations full confidence can be reposed; for, as we shall afterwards see, exaggerated recitals are not wanting as well respecting the nature of the country as the character of the inhabitants; it has pleased the writers to represent the latter as hideous savages, eager for blood and carnage, and making it a duty to adorn their habitations with human trophies. These stories have been contradicted by the narratives of our countrymen who have penetrated into some parts of the country where the aborigines have never had any relations with Europeans. But Borneo occupies too large a surface for any European government whatever to succeed in exploring all parts of the island in the course of a few years. Nevertheless we can say proudly and confidently that the Netherlands Indian Government has already in this respect accomplished a beautiful and noble task. More recently it is taking effectual measures to extend and consolidate its power in the interior, and cause its authority to be respected by the Malay princes who are subject to it, as well as by those over whom it exerts its influence through treaties and contracts which bind them to the European power. We

flatter ourselves that these measures will have the immediate effect of repressing piracy, and annihilating it completely, if that be possible, but above all, of lending a succouring hand to the indigenous population, whom it is our duty as well as our interest to withdraw from the domination of the Malay despôts.

Thirty years have hardly elapsed since the time when our Government regained possession of our ancient factories; Borneo was then a land almost unknown to Europe. Sir Stamford Raffles even describes it in his writings, as forming *a blank space on the map of the world!* Now, this large portion of the globe is no longer indicated by some doubtful lines traced on paper, but this great land, of which the superficies is 12,743 geographical leagues, begins to occupy an important place in the annals of geography and ethnography. Some parts, but recently totally unknown, have been explored by our naturalists; their journies have also been distinguished by the acquisition of a knowledge of the courses of some rivers, the navigation of which will offer new routes for developing the commerce of the eastern side with the parts of the interior. The superior officers of the army of India have been commissioned to ascend the principal rivers which have their embouchures on the east and west, and to regenerate these two coasts. Diplomatic missions have been sent to renew the former treaties with the allied Sultans, and new contracts made with many Malay princes of the eastern coast will consolidate our power, while at the same time they are intended to protect the natives, and to repress piracy in the seas between Borneo and Celebes. But these are only preparatory measures for the attainment of the ends which ought to be proposed. The future promises to government much more important results, if ever so little it will continue to consecrate some of the annual surplus which Java pours into the treasury to extend its influence in the interior of Borneo. For this end, let it spare no means for acquiring precise notions respecting the physical constitution of these countries, and set it as a task before it to penetrate more and more to the centre of the country, seeking before all exact knowledge; when it shall have made its influence be appreciated in the midst of the indigenous po-

pulation, and when the Dayaks have found protection and support from the European authority, then the latter will be able to dictate its laws and to maintain its power over the Malay princes of the coast have who submitted to it, or with whom treaties have granted the right of intervention. To know with exactness the courses of the principal rivers and their affluents; to determine their depths, and indicate how far they are navigable, are indispensible measures in a country which presents no other means of communication with the interior. We ought also to ascertain which rivers are most constantly frequented by the indigenous populations and upon the sinuous borders of which the greatest number of their villages are established; it will be necessary to undertake researches to obtain precise data concerning some principal villages which can be selected by the Dayaks as entrepôts for their petty traffic by barter with the Malays of the coasts, and this particularly with the aim of establishing there our posts or small factories, and thus placing ourselves in relation with the tribes who will resort there to provide themselves with the first necessaries, articles of which it will be essential to know the nature and the kind desired or sought amongst the inhabitants. The greater number of these tribes without doubt, have their habitations constructed in the vicinage or along the banks of these large rivers; probably also they are situated in localities where other streams join the principal river; it is there that we ought to fix provisionally the establishment or chief place of our commercial transactions with these people; it will be necessary as far as the locality will admit, that this principal factory be established in the centre of the country. Now that river navigation avails itself of iron steamers, it appear to us that there no longer exists any difficulty which could materially obstruct an experiment of this nature, which appears to be the only proper way for opening up to us the interior parts of Borneo. We shall have still some observations to make on this subject in treating of projects of exploration and of colonization in this island.

The geographical position of Borneo relatively to the other possessions of the Netherlands in these seas; the very great number

of its rivers navigable far into the interior; the richness of its products and the fertility of its soil; the treasures hidden in the bosom of the earth; its climate, which is said to be salubrious; its advantageous position for commerce in the seas of China and Japan; its immense size, combined with its scanty population, which adapts it for colonization; but more than all these material advantages, the interest which ought to be aroused in us by the people of the interior, bent under the yoke of Malays, whose miserable lot causes humanity to lament, and for whom philanthropy claims the intervention of civilized nations; all these considerations are so many motives for engaging the Netherlands government to put their hands promptly to the work, in according effectual protection to these oppressed Dayaks, whom in the nineteenth century we behold still plunged in all the ignorance, which is the companion of misery, as well as divested of all those spiritual aids of which savage people partake. If it is true that we ought to pardon the government of the old Company for not having taken more salutary measures, during nearly two centuries when it exercised power in the Archipelago, for securing the well being of the aboriginal population of Borneo, it is equally manifest that such a feeble consideration will not at this day serve to excuse us, if we neglect any longer to fulfil the duty which humanity appears to demand from us; for the masters of the flourishing metropolis of the Archipelago cannot now admit of any delay which would remit to a future period the accomplishment of this work, in which the national honour is intimately concerned. The sympathy in the opinions manifested on this subject by the different parties in the European metropolis, joined to the interest which at the present day the whole nation attaches to our beautiful intertropical possessions, are powerful motives to engage the authorities of India to take the most efficaceous measures in order that the Dayaks should be speedily able to enjoy the benefits of civilization; and at the same time, let us say, these measures are equally necessary for maintaining *the incontestible rights of Netherlands over the island of Borneo*. In the midst of the general movement of commercial nations, as well as that which manifests itself in the Indian Archipe-

ago, and which will augment more and more the development which European commerce must necessarily experience in the China Seas, it is our interest not to shew ourselves the last in this race; for India, China, Malasia and Australia are the cardinal points towards which commerce appears disposed to direct its principal speculations. Let us endeavour to turn to profit, while there is yet time, the inheritance, rich and fertile in resources, which we owe to the persevering efforts of our ancestors, and let an intelligent solicitude watch over these possessions of Malasia, almost the sole remains of the old commercial splendour and rich colonies which Netherlands formerly possessed,-precious remains which she has had the good fortune to preserve at the price of the greatest concessions, as well as the hardest sacrifices.

(To be continued)

هاري احد مالم دمڠكو　　صراني مڤمبه كبرهلان
نارغسياف چاكف مناهن رندون　　اينوله بسر اكن فهلان

ايرمدو دالم تمبيكور　　فوكوْ ليلغ دتغه فادغ
ريندو مالم دباوا تيدور　　ريندو سيغ دباوا برتندغ

اورغ برلابر برتالي كلت　　بسرت اد دغن تالي باهو
جڠ لوك تاغن دافة دليهت　　لوكان هاتي الله يغ تاهو

انچيْ كاچوغ اورغ ددالم　　مينم سربت ايرمدو
راچون دمينم جادي فناور　　سبب ترلبه٢ مناهن رندو

سوڠي كاغ كمفغ چيْ ريفي　　دسبرغ فڠكالن راما
تيدورمالم ماسق مڤفي　　باڠي تيدور برسما٢

دوا تيڠ چنچين دجاري　　يغ سبنتوْ ساج دبيلغ
دوا تيڠ دانت دچاري　　تيدق سام باڠي يغ هيلغ

ڠيلغ فاكو ڠيلغ　　كوفو٢ راما٢
هيلغ اديق هيلغ　　بير هيلغ برسما٢

ڠونغ فنتي تڠكي مڠاوان　　تمفأ دري جوهر لام
بوه هاتي تڠكلله توان　　ايغ فرڠي تيدفله لام

كالو توان مرديق كجمبي　　امبلكن سهيا بوة دليما
جڠ توان كاسهكن كامي　　باوا سهيا فرڠي برسما٢

ملاك بركوة باتو　　ڠريجا داتس بوكيت
سمبه سهيا سده برلاكو　　فنتا سڠرا لكس سدبكيت

MISCELLANEOUS NOTICES, CONTRIBUTIONS AND CORRESPONDENCE.

LETTERS FROM THE INTERIOR OF BORNEO (WEST COAST,)

NO II.

Karangan, January 14th. 1847.

Of a body of facts concerning a people situated as are the inhabitants of this vicinity, (and I speak of these only,) the bulk must be far other than pleasing: as to the accuracy of what you are to read, the notes will convey the personal observations of one who has just passed his fifth new year's day amid Dáyák homes, and is not himself aware of any departure from fidelity in narrating what is founded on the testimony of repeated eye witnesser, or corroborated statements of various native informants. Recent circumstances and reflections having led me to a thorough statistical examination of my immediate neighbourhood, the palpable certainty is disclosed that the population is steadily becoming less, in a saddening ratio, by excess of deaths over births. For instance, in a population which numbered, two years ago, one hundred and sixty, fourteen have died and scarcely an infant is to be seen. Within the last 8 months an almost total deficiency of truly wholesome food has prevailed, and famishing, rather than ordinary disease, has caused an unwonted proportion of deaths: four adults, of the average age of 45 to 50, perished from that small circle last month, *and yet of those who remain, barely one third are under fourteen years of age.* To this latter fact I venture to ask a special attention, for, though I have given no attention whatever to tables of population, I think I cannot be in error in regarding it as singular and ominous of exhaustion: and I would gladly see an opinion from yourself, or some gentleman having data at hand, as to the proper proportion in 100 for children under the age above named. On turning, at this moment, to an "American Almanac" I observe that, of the white po-

pulation of the U. S. in 1840, not far from 44 per cent were under fifteen years of age, while of the slave population (among whom are many instances of special longevity) the proportion of children under ten is fully equal to the proportion under 14 here. Waiving, however, all conjecture as to what number of the human family falls within the first fifth of man's "three score years and ten," I return to the general fact that the population of Kárángán has, for many years, been diminishing, and is still becoming less with every lustre. He whom the periodicals of the world delight to honor, whose authority I have never seen questioned—will tell you that not only is this so, but property and rights and industry were known, when he was a listening, witnessing boy, where *now* poverty, squalor and oppression so abound: I refer to no other than "the oldest inhabitant," and, though this venerable link of one century with another may paint broadly and warmly, there is a broad and chilling truth in his pictures of decline: nay, rather, the blood of a Christian spectator might fitly warm with hallowed indignation at the architects of a ruin so well nigh complete. This Dáyák of To-Day, indolent, filthy, ungrateful, mendicant that you see—improvident—unchastely loquacious—ingeniously obscene—his very liberty of spirit held in pawn by beings viler than himself—trodden as he is is oppression's very wine-press of contempt—feels at times a prompting worth within him, and uses to his rulers speech so plain that listening courtiers fain would dare admire: God grant that his long—slumbering energy may, ere long, lose, by proper means, its incubus, and rise to follow fitting guidance to glorious results! Before proceeding to a few of the customs of the Dáyák (as here found) I will illustrate, in a word, the fairness of one or two of the adjectives applied to him above: some of them need no setting forth,—others avoid the publicity of type perforce. I called him "improvident," and give you as the reason for so saying, that he almost never raises a fair 8 months supply of food for his entire year, and that he has been known to buy, this very day, one chupak or one gantang of rice for a sum of money which, before the end of three weeks, will purchase 12 to 14 similar measures, of a better quality. He has

been living upon Sago and other forest-food, and still can do so until the opening of February furnish his own garners from the harvest-field, but with the trifle of money he may earn he will secure at all hazards the only vegetable he really values when a choice is open. To the credit of the Dáyák I must state my belief that grain thus dearly bought is chiefly for the more advanced in life, while justice to the vending harpies requires the statement that the price here is nearly *five fold* that which obtained at Pontiánák on the 20th. ult. It may illustrate the adjective "ungrateful" if I mention that men who have been employed by me, and received as part of their wages (by request) rice at sea board i. e. Pontiánák rates, have done their work more idly than usual: nor have I been surprised at the coolness of able-bodied men who have proposed to borrow grain (bought at famine prices) on the guarantee of their individual veracity that a strictly equal quantity, by measure, should be returned to me after the gathering of their crop! On the subject of interest I may perhaps have spoken in the letter of last month; it is its duplication of a debt which bears so devouringly upon the Dáyák, who is fatally prone to incur obligation: a debt of two rupees formed a year ago needs no other increment than that which results from neglect to pay, in order to reach, by January 1850, the sum of sixteen rupees, the creditor having the right of levying on the property, time or person of his debtor. As many are always in debt, and thus liable to be called into temporary and ill-paid service by a capitalist who may or may not be "seized" of an estate to the value of two to three crowns English, and as a rajah may, at any moment, summon half the male population to labor without limit other than his caprice, a Dáyák can never feel that he is master of a day for his own purposes. The taxation upon purse and harvest is, relatively and absolutely, light when compared with the case of other people and regions, but pretexts are made for the grossest abuses. Perhaps a semi-idiotic but titled lecher demands "the pride of the village," with the alternative of money-redemption; or an equally worthy fellow in rank deposits in the hall of a "radang", with a price of shameless exorbitance affixed, a basket of tobacco, which no lover of that weed

would willingly accept at even a nominal cost. Of this latter class a case occurred in 1846, wherein a non-compliance, in part, with the exaction, entailed upon the head man of a miserable hamlet a fine of 120 rupees. Let this suffice, for the present, as to general condition. Amid all this social degradation, however, there is spirit, there is pride: we may, in the progress of our notices, find the Dáyák evincing hospitality, intelligence and kindly affections.

HABITS, CEREMONIES, SUPERSTITIONS. &c.

A *marriage-ceremony* I have never attended, but am informed that it differs in no essential of form from that of the Malay: the obligations of that alliance are often contracted before the age of puberty. In a case of divorce of the character which our scriptures warrant, the injured party receives a sum of money adjudged by a committee of "di ama" (*old folk*,—in such a case, males): where separation is the result of lesser causes, the repudiating party pays a small amount, at the discretion of the judges. Where the investigation of a charge of adultery establishes the criminal act of a wife, her husband recovers damages from the destroyer of his peace, and straightway feasts the court: and here I am sorry to add that one husband whom the notoriety of a trial has, on two several occasions, pronounced an injured man, is tolerated by public opinion in retaining as a wife the frail decoy that has thus put money in his purse. The voice of this fact is loud and clear. The "damages" awarded may be one to two dollars, and as the offender can only secure that sum, in most cases, by unusual industry or by employment from us, and as interest and sympathy prompt his fellows to conceal from us such a fact, which would close the easier resource against him, it is highly possible that the frequency of such cases is not fully known. In one case, where both the guilty parties were married persons, it was decided that should the man elect (as at first seemed probable) to leave his own wife and children and take the paramour as his partner, the option was open to him for a sum equivalent to about eighteen dollars, to the be paid to the worse than bereaved husband and his

deserted wife; he paid the usual moderate fine and rejoined his family, after vainly proffering a request at Oto for employment by the year.

A few words as to *a Dáyák funeral.* The death of an acquaintance is very commonly spoken or heard of with a smile of levity and some jocose remark; and, though these readily give way to rebuke, and are followed by a sufficiently serious manner of listening to remarks upon the solemnity of the event and its connection with an endless future, the belief is cherished that, if they are to "live again," Sabaiatn will be the scene. Of this "heaven" of the Dáyák I can give no reliable account; he has ever been chary of revelations touching his religion, and, since the exposure of what he *did* make known as vain and guiltful, has sensitively avoided explanation. A funeral occurs, if practicable, on the day that witnessed the death—in consequence, no doubt, of the universal dread of "amot" or ghosts. An infant may be still living at 3 o'clock P. M., and, before 5 o'clock of the same afternoon, you shall see its yet flexible form borne by your door, in the arms perhaps of a grimly-smiling grandfather, and committed, in its bark wrapper, to the earth. It is but a few weeks since a case of this precise character occurred, and every accessory—the cold, pitiless rain falling at the moment—the miry state of the soil—made the act abhorrent. It was like the burial of a dog, the witnesses barely two in number. If an infant have attained an age at which it interests the indolent relatives—as when it can attempt to stand or talk—the loss is more appreciated; and in whatever case, a boy is more lamented than a girl; indeed if a parent who has borne several female children lose her only son—especially when the infant has passed the first year—the grief, perhaps the blasphemy, is earnest and sore. An adult is buried with rather less of unseemly haste, but, as a rule, if circumstances favour. i. e. if the weather be not very inclement, and friends to assume the diging of a grave be at hand, night finds his body absent from its recent home for ever. The corpse covered with a white cloth and wrapped in bark, is borne upon the shoulders of the eldest son or nearest friend to the distant burial-place, and, if the grave be not

yet ready (or, as in one case that I witnessed, not yet attempted), the body is placed in a leaning position against a tree, and the work is begun by one or two of the very few present. In the instance referred to, a mother had suddenly died in the brief absence of her son, and something of sympathy was felt for him as he sat awaiting the completion of the work: but it would seem that timidity amid the associations of "God's Acre" compels the Dayak to utter jests from the very grave that he is preparing for a friend. The slow process was, to open a space of 2 by $2\frac{1}{2}$ feet at either end of the intended grave, leaving an earth-partition between those openings of perhaps 15 inches' breadth: of course, operations soon became difficult for the use of a spade at either end, but no movement was made for the destruction of the wall between. As I was present with a view to conducting a christian service, and the weather of noon was very oppressive, I hazarded a personal removal of the partition, in order that a depth of four feet might be reached without a waste of hours; for what reason soever it was allowed to remain, I was happy to find that no repugnance seemed to be felt, and I may add that subsequent commendation of the act of assistance (to villagers at a distance) would indicate that no special sacredness attaches to the old custom. On the completion of a grave such as would be formed for a European, however, the work is yet unfinished. A lateral excavation is now made, from the bottom, of such depth in the bank that the body may be quite admitted, and be without the line of the falling earth at the re-filling of the grave. At this point the chief mourner in the case before us commenced a piercing howl of invocation (I say it in all kindness) but soon refrained as he was aware that prayer was to be offered: the memory of his voice, as he sat in the grave looking for the last time on earth upon the rigid features of her who gave him birth, is vivid as I write. A fence of short stakes was then made before the inner excavation—a blanket of bark extended from the foot of it to the lip of the larger grave, and the earth was again thrown in and hammered to a smooth hard, and regular oblong form, a few inches above the surrounding surface. Then followed a ceremony accompanied with some hesitant

embarrassment for the folly of it, but courage was summoned, and all, seizing the wing and entrails of a fowl, tore away, each his piece, and cast it away—fiercely and rapidly, the while exorcising all evil spirits from pursuit and molestation. A plate, at least, is left (and a jar, in addition, is proper) at the head of the grave: in the case of an infant, the enveloping white cloth is sometimes carried home again, or the rice that was brought is given to an accompanying dog, neither of which acts is probably in accordance with public sentiment. Some sort of entertainment is bestowed by the relative of the deceased upon the party who performed the funeral-rites, varying with the means of the family; he who can afford it kills a hog and presents a portion of pork, &c., to each of those who have assisted: the dishes in which the food is distributed are of different sizes to the bearers of the several duties, and are intended as presents; immediately about us this is rarely done in full, owing to general poverty, but it is manifest that a true history of this people as they here lived when America was a wilderness, or even as they were an hundred years ago, would develope very much of interest ing superiority to what can now be seen or vaguely heard of.

Of *climate* I shall say merely that 66° and 88° to 90° of Fah't are perhaps the extremes—at least, such is the experience of a few years, with a trifle above 77° as the mean annual temperature. Properly speaking, a dry season is scarcely known, the nearest approach to it occupying the months of summer in Europe. The tremendous force of a rain-fall is often such as to baffle ordinary comment, and, among many descriptive phrases which are furnished from the vocabulary of Dayak conceits, "ujatn arai, 'sa" (literally "a *he* rain, this!") is the latest I have heard. Diseases, other than many of cutaneous character, are not numerous—fever and ague and rheumatism being chief; the great destroyers are atrophy, neglect and idleness. Of various superstitions, ceremonies in time of sickness or general mirth or triumph, jugglery, charms and prevalent habits, something may be said at a future day: this record I have made in moments caught for the purpose on several different days, and, if it appear disjointed, you have in that fact the reason. In the hope that some

of the present generation are to see the Dayaks a Christian people I write myself

Yours truly,
KALAMANTAN.

BIRTHS, MARRIAGES AND DEATHS AMONGST THE EUROPEAN POPULATION OF BATAVIA IN 1847.*

We have received from the Resident of Batavia a return of the Births, Marriages and Deaths which have taken place in that Residency, amongst the European population, and persons placed on the same footing, during the year 1847, the result of which will be seen from the following table:—

Months	Births	Deaths	Marriages
January	19	44	5
February	9	16	6
March	14	19	6
April	8	19	2
May	13	20	1
June	15	23	0
July	14	25	4
August	13	28	4
September	21	18	4
October	23	29	7
November	15	16	5
December	16	15	6
Total No., ...	180	272	50

Amongst the Births are enumerated:—

Legitimate children	138
Acknowledged „	33
Natural „	6
Adopted „	3
Total number of children,.....	180

* We are indebted to the Editor of the Straits Times for this extract.

Amongst the Deaths are enumerated :—

Male Civilians	48
„ Military	59
„ Seafaring people	55
„ Under 18 years of age	-
Total Male Deaths,	184
Females above 18 years,	47
„ under 18 years,	36
Stillborn	6
Grand total, Deaths,	272

Amongst the 50 married couples it may be remarked that 46 of the males were civilians and 4 of the Military profession. During the year 1846 there was one marriage disolved.

On comparing the above results with the return from 1836 to 1846 inclusive (vide Java Courant. March 31st., 1847) we must conclude 1847 to have been a peculiarly fortunate year. The number of births from 1829 to 1836 both years inclusive, averaged 184 to 185 yearly; from 1837 to 1846 inclusive from 189 to 190 births. From the latter period to 1847 there was no great difference observable. The number of deaths in 1847 was less than in any former year or from 1829 to 1836 when the deaths averaged 469 yearly and from 1837 to 1846 the deaths averaged 460 to 470, whilst in 1847 the number was only 270.

The marriages have increased on the average of the years 1829 to 1846, when they numbered 44 couples yearly; in the number of births and deaths the difference is even much greater. The deaths comprise a large portion of military and seafaring single men; amongst the 372 deaths for the year 1847 we find that 59 were military and 53 seamen, or a total of 114, against 158 civilians and females.—*Javasche Courant, April 1st*, 1848.

Maxima and Minima of atmospherical temperature at Singapore.

May, 1838.

	Min.	Max.
1	74	90
2	75½	91½
3	73½	93
4	75	95
5	72	92
6	75	92
7	72½	92¼
8	74½	93
9	73½	93
10	75½	93
11	75½	90
12	74½	88¾
13	73½	88½
14	74	86
15	74	88
16	73	92¼
17	73	93
18	74¾	89
19	73	91
20	75	92
21	74	91
22	75½	88
23	75	90
24	73	87
25	75	83½
26	72½	77
27	72½	86
28	72½	
29	72½	91
30	73	83
31	73½	90

Mean { Min. 73. 87.
Max. 89. 75.

J. R. L.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

REPORT ON THE ISLAND OF BANKA *

By Thomas Horsfield Esq, M. D.

SECTION I.

GEOGRAPHICAL DESCRIPTION OF THE ISLAND.

Many of the points and promontories of the western and of the northern coast of the island of Borneo have been observed with accuracy. Situated in one of the most frequented tracks of navigators through the Indian Seas, the external geography became an object of attention and nautical survey long before the island was known to yield any production of importance.

During later periods several of the settlements on the western, northern and eastern coasts were occasionally visited by private adventurers, but the geography of the interior was not cultivated until Bánká became a British possession, and our acquaintance with it is still very imperfect. I have attempted a concise description of part of the island in order to illustrate the following mineralogical account, and the history of the tin mines. The materials for the purpose were collected during a journey through the northern and eastern divisions.

In order to have some authentic guide to direct me in determining the relative situation of the principal settlements of the interior, I have taken the most distinguished points from the chart of the

* See the Introduction to this Report ante p. 299.

island and neighbouring seas, most recently published for the use of navigators. The accuracy of this, though not infallible, has, according to my personal experience, assisted by the information collected on the spot, appeared sufficient to form the outlines of a map of the island, explanatory of the following description, which is submitted with due deference to the candour of those persons, who may be disposed and qualified by opportunities of practical information or professional pursuits to afford it improvement or correction.

The form of Bánká is irregularly oblong. Its general direction is from north-west to south-east, nearly parallel to the southern extremity of Sumatra; the passage which separates these two islands is one of the most frequented in the Indian seas, and sufficiently known as the *Straits of Bánká*.

The northern and eastern shores of the island are surrounded by the southern extremity of the China Sea, and its southern boundary is the Java or Borneo Sea. The most northern point of the island is called by the natives Tánjong Krássák, and situated in the latitude of 1 degree and 28 minutes, and the southern point, Tánjong Sumbuáng-dapur in that of 3 degrees and 7 minutes, south of the equator. The extreme western point, Tánjong Bátu-Besáyáb is situated in the longitude of 105 degrees 5 minutes, and the extreme eastern point, Tánjong Merrun in that of 106 degrees 56 minutes, east of London.

The points of greatest distance in the north and south are Tánjong Pámudshá and Tánjong Merrun, a line drawn between these points, obliquely through the island according to its natural extension from north-west to south-east, has a length of 146 English miles. The breadth of the Island from Tánjong Bátu-Besáyáb in the west to Tánjong Ráyá in the east is 78 miles.

Although the original inhabitants have given names to those districts in which they reside as well as to the establishments of the Malays and Chinese, to many of the rivers, points, mountains &c., of the island, yet there is no general subdivision which can facilitate the description. I have therefore adopted one which is pointed out, by

the natural form of the island. According to this one portion may be properly denominated the *western division*, another the *northern division*, and the third, which comprizes the great body of the island, the *south eastern-division*. The boundaries and extent of each will be pointed out in the following geographical details.

A number of small islands are found in the seas surrounding the coast of Bánká; the most considerable of these are 1. *Pulo Pánjáng*, on the eastern coast opposite the discharge of Maráwáng-river; 2. *Pulo-Lipár* near the south-east extremity, forming a strait called by the natives Selát-Lipár, but neither the situation of the strait nor of the island has yet been determined with accuracy; 3, *Nuso-Párí*, erroneously called Lusí-párá, at the southern entrance of the straits of Bánká, between this island and Sumatra; 4, the *Nángká* islands, nearly opposite the discharge of the river of Selán, besides a number of small islands whose name and situation have not been ascertained.

My endeavour has been, in the following geographical account of the island, to point out as nearly as possibly could be done, with my sources of information, the situation of those places which will be mentioned and refered to, in the description of the settlements and mines of the island, as well as in the detail of the mineralogical and botanical remarks. I have been solicitous, as far as possible to investigate and point out the principal rivers, the bays, the most prominent points of the coast, the mountains and ridges of hills, the settlements of the Malays and Chinese, and the divisions adopted by the original inhabitants.

The remarks of a general nature, the description of the face of the country, the inhabitants, their mode of life and occupations, the state of agriculture, the history of the different settlements &c., will be contained in the journal, or form subjects of separate essays.* My object at present is a concise and clear description of the island, and my only ambition a moderate degree of accuracy.

The WESTERN DIVISION of the island is comprised between the

* See the Introduction, ante p. 299

northern part of the Straits of Bánká, and the Bay of Jebus. It forms a separate peninsula. It is divided from the great south-east division by a line drawn obliquely across the island from the discharge of the Mendu river to that of the river of Maráwáng. The line of boundary between the northern division is supposed to extend from the mouth of the river of Kámpák to the source of that of Maráwáng, which it follows to its discharge. This division therefore comprizes a considerable portion ot the central parts of Bánká: but it becomes gradually narrower as it approaches the eastern shore. The advantages of this division will appear in the sequel: any other arrangement would separate those districts which are united under one native chief.

From the discharge of the Mendu river, the coast takes for a short distance a nearly northern, and after this, upon the whole, a western direction to point Tánjong Kálián, the extreme south-west point of this peninsula; its stretch is now north, with some slight deviations to Tanjong Bunud, and then east, inclining to north, to its junction with the northern division, at the discharge of the river of Kampak.

This division of the island, although secondary in point of antiquity to the former settlements at Bánko-kutto, near the foot of the Permissáng hills, has been the most important since it was acquired by Plembáng, and since the Tin-mines were discovered and worked.

Towns of Minto and villages of the District.—The first establishment of any note by the princes of Plembáng was at Minto. This town is situated nearly four miles from the extreme south-west point of the peninsula abovementioned. It contains at present the largest number of inhabitants collected in one place, although there is nothing peculiarly remarkable or favourable in its situation, except its vicinity to the river and capital of Plembáng. It consistsof a long range of houses, built nearly parallel to the shore, with some regularity as to its longitudinal extent, on a narrow sandy plain, bounded somewhat abruptly in the north by a steep acclivity, which has a winding direction. The plain is consequently unequal in breadth, and the town is accommodated to the space remaining at the foot of the hil,l which in some places admits of a double or triple range of dwellings.

The western portion of the town is built, upon the whole, with most regularity; it is divided, where the space admits, by neat cross ways; near the centre, where the acclivity of the hill is less abrupt, the houses of the Rángá (the chief of the village) and of several other of the principal inhabitants, are built on the eminence. Beyond the centre the sandy plain is more extensive, but the dwellings are spread over it with less order; towards the eastern extremity they are again confined by the steepness of the hill. From the roads the whole range of dwellings which forms the town cannot be taken into one view without interruption, large clusters of trees are spread through it, which conceal the houses in various situations.

The houses are built in the usual Malay style; elevated from the ground by poles or pillars, and containing an open space below. Those of the more wealthy inhabitants are lined on the sides with planks, the others with the bark of trees. The roofs consist of Ataps, which are prepared from the leaves of the *Nipá* palm (the nipa fruticans) into a covering resembling thatch.

Several of the chief inhabitants have extensive dwellings, constructed with considerable neatness, divided into various apartments and affording a good deal of convenience: those of the poorer class consist mostly of a single room. The aggregate number of houses is 357 and of inhabitants 1546 (N.B. about the *end of July* A.D. 1813.)

A river called Sungie Minto-Táwár discharges itself into the sea about the middle of the town; Sungie Minto Azin is situated nearly a quarter of a mile to the west; the outlet of Sungie-Telok Robíyá is near the eastern extremity. Separated by an eminence extending abruptly to the shore, about half a mile further east, we meet a distinct village, on a small rivulet, called by the same name, *Sungie-Báru*; it is considered as belonging to Minto.

The environs of Minto differ in no degree from those of other parts of the island in which settlements are formed. No species of culture is carried on with any regularity. The hill which bounds the town towards the interior is covered with fruit trees of every kind, which form, in a highly fertile soil, an artificial forest, growing in promiscuous luxuriance.

A new establishment for the various duties of government in this part of the island, has lately been formed on the eminence about half a mile above the town.

The former and present condition of the mines of Minto, will be described below.

Several small villages and hamlets are dispersed through the wilds in various directions from Minto: the chief of these are at *Dárát-lamá*, *Kádur* and the hill of *Duláng-pitsha*. *Dárát-lamá* consists of the dwellings of a number of mountain people, (by which name the original inhabitants are usually distinguished) who formerly sought a retreat in this part of the island; from the southern districts they are united under one chief called *Tje-wáng** and live in their usual manner, separately dispersed through the country north-west of Minto, on a rivulet of the same name, towards the extremity of the peninsula. *Duláng-pitsha* lies west, and Kadur nearly north from Minto, these both contain a small number of families.

The river of *Minto-Táwár* rises in this part of the country by three springs, called Sungie Dárát-lámá, Sungie Bábí and Sungie Deyáng. A large settlement of Buginese existed formerly at Tánjong Ulár, containing a large number of families, and a population of several hundred souls. Mendsheláng, Sungie Reáng, Anashle and Beál will be mentioned in the account of the mines.

The mines of *Palángás* are situated in a direction north inclining to the east, at a distance of about 10 miles from Minto: *Ráng-ám* is a Chinese village about 4 miles to the east, nearly half a mile from the shore, partly in a valley, partly on the declivities of a hill. It contains about 25 houses, built in the usual Chinese style and nearly 60 male and 30 female inhabitants. About 25 of the Chinese of this village are miners; the rest live chiefly by horticulture and by the rearing of hogs, to which they pay uncommon attention, as they are profitably disposed of to the miners and other inhabitants of the neibourhood; a few of them are fishers. A large mine is situated near the north-east extremity of the village which will be mentioned elsewhere.

* Jennang? Ed.

Penjalin-belo, sometimes called Rángám-báru, lies about 1 mile further eastward, and nearer to the sea, from which it is separated by a slight narrow eminence, covered with jungle. It contains the vestiges of a former extensive cultivation, and has become remarkable in consequence of the temporary establishment of a convalescent Hospital in the commencement of the year 1813. Between Penjálin-belo and Rángám are the remains of a former settlement at *Sungie-buntu*.

Belo, nearly one mile further eastward, is at present an inconsiderable village, containing about 12 Malay and 15 Chinese families; it is situated above half a mile from the sea, in a low plain, near the banks of a river, larger than that of Minto-táwár abovementioned. It was formerly one of the principal tin districts of Bánká, but has declined with the exhausted state of the old mines; those which are at present worked, are situated nearly 8 miles in the interior, in a direction (from the village) north or north-east, near the center of the peninsula at Meng-gelám and Páit-duláng; the former is the most important.

The eastern portion of this peninsula, to the district of Támpeláng is, near the coast, an uninterrupted almost inaccessible desert, the interior is divided into several districts which are inhabited by the mountain people, and will be mentioned in the sequel.

Támpeláng lies nearly 25 miles to the eastward of Belo, near a small river of the same name. It was formerly inhabited by Chinese, who worked the mines in the neighbourhood in a regular manner. As they committed a number of oppressions on the mountain people, these united against them, and, assisted by the Malays who lived here, compelled them to retire. Támpeláng has, during the last twenty years, been repeatedly ravaged by the pirates: at present a small number of mountain-people work several inconsiderable mines. The former stockade, built with uncommon care and expense by the Chinese, still remains nearly entire: it contains at this period, with the neighbouring village, a population of 16 families, Malays and mountain-people.

Rivers.—Having mentioned the chief villages and settlements, I

proceed to enumerate the most considerable rivers along the coast of this western division, from its boundary in the south, to its connection with the northern division.

At the mouth of the river of Mendu I have placed the point of separation between the western and the south-east division of the island. This river rises near the confines of the district of Pángkalpináng, from the eastern parts of the island, and from its direction has been made use of for carrying on a direct intercourse from Minto to the eastern settlements. At *Pángkál-Mendu*, which can be reached from the discharge in one day, a village is at present established or at least planned; the inhabitants of which will assist in carrying on the communication between the places mentioned. Several small islands are placed before the discharge of this river, the chief of which are Pulo Antu and Pulo Meddáng.

The river of Kutto-waringin, discharges itselfs about two miles to the north of that of Mendu; it is formed by two branches, the chief of which is called the river of *Dshuruk* and rises in the low, marshy plains, to the north of that village towards the foot of the mountain Márass: the second branch, which passes the stockade of Kutto-waringin, is less considerable. These unite several miles below the stockade, when the river pursues with various curves a south-west course to the sea.

The river of *Támpeláng* is not considerable, but that of *Dshering* is one of the largest of the island, and at its discharge nearly a mile wide. It rises in a district of the same name near the foot of the mountain Marass, pursues, upon the whole, a course from north-east to south-west, receives numerous branches, and discharges itself into an extensive bay which will be mentioned in the sequel. As well this river as that of *Sukál*, the next in succession on the coast, whose outlet is about two and a half miles to the east of point Tánjong Punie, pass through a country which is waste and almost uninhabited, being only occasionally visited by the mountain people, when in search of spots to form their temporary rice-plantations. Extensive swamps, called rawangs by the natives, partially inundated and covered with shrubs, occupy in many places the banks of these ri-

vers. Several miles to the west of Tánjong Punie, the river of *Belo* discharges itself into the sea in a direction nearly south of the village of the same name above mentioned. Following the coast in a western direction to point Tánjong Kálián, we meet in succession the mouths of numerous rivers and rivulets, as Sungie (or river) *Pendjalin-belo*, Sungie *Buntu*, Sungie *Rangám*, Sungie *Páit*, Sungie *Gemuru*, Sungie *Nebun*, Sungie *Báru*, Sungie *Teluk-Robeyá*, Sungie *Minto-tawár*, Sungie *Minto-Azin*, *Ayer-Bugis* and *Ayer-Bátu-rákkit*, at the foot of the hill near the establishment at Fortnugent; besides several inconsiderable rivulets.

Between the points Tánjong-Kálián in the south, and Tánjong Ayer-Más in the north, the rivulets of Tembelu, Mendsheláng, Nebun, Reáng, Andshel, Beát, Mendul and Sungkáy, flow, nearly in a western direction from the foot and environs of the Mánumbing hill; after which, proceeding along the coast, Sungei Rámbát, Sungie Mentebá and Sungie Pálángás discharge themselves successively into the Bay of Jebus. Of these rivers, the last is the most important; it rises from a hill east of Mánumbing and passes the mines, which, after it, are named Pálángás.

The river of *Kámpák*, which discharges itself into the Bay of Jebus near a village of this name, is one of the most considerable of this part of the island: it has different denominations in its course. Two of its principal branches arise from the hills to the east of Mánumbing, the first of these, proceeding up the river, is called Sungie *Kátul*, the next Sungie *Pisáng*. The principal stream is now called Sungie *Jebos*, and soon sends off a smaller branch, taking a northern course, on which the stockade of Jebus is built. Higher up the river receives the name of Sungie-*Butun*, probably from the district where it rises. About one mile above its discharge into the bay, the mouth of the river is divided by several islands, the principal of which are Pulo Selát and Pulo Besár.

The *Bay of Jebus*, sometimes called the Bay of Sungie-*Gulu*, is comprised between point Tánjong-Genting in the north, and the points Tánjong Ayer-Más and Tánjong-Burud in the south. Its form is simple and regular: the depth of the water gradually diminishes

from 8 to 3 fathoms, the bottom consists chiefly of mud. As far as has been ascertained the middle is completely clear and safe, several rocks are pointed out near the shore by the natives at Bátu-Meráwá, and near the discharge of the river of Kámpák; vessels are completely sheltered in it during the east monsoon.

Leaving the points just mentioned, at the southern extremity of the Bay of Jebus, and pursuing the coast towards the south, we meet, after the inlet and rivulet at Beat, the points Tánjong Ulár, Tánjong Bátu-Bátumpá and Tánjong Bátu-Besáyáb, between which several inconsiderable rivulets and bays occur which are noted on the map. A reef of rocks extends to the north-westward from Tánjong Bunud, and another between Tánjong Ulár and Bátu Bátumpá.

That extensive bay which is comprized between point Tánjong Kálián in the west and point Tánjong-Punie in the east has lately attracted much notice, in consequence of different settlements which have been formed on it. From the principal town it is generally called the *Bay of Minto.* It is foreign to my object, at present, to point out the advantages and defects of its various parts, in a nautical point of view, or to determine the question, whether any of them is calculated for a port. This has already been partially done by professional men. I shall only remark that the western part, Tanjong Kálián, which, as far as regards convenience of landing and disposition for defence, is best calculated for a permanent establishment, is disqualified by the deleteriousness of its atmosphere; while the situation of Minto, judging from its antiquity and the character it has acquired among the natives, will probably be found less objectionable in point of healthiness, though far inferior in the requisites for forming a convenient port.

At each of the extreme points of this bay a considerable reef of rocks exists, at the distance of several miles from the body of the island: the western is called *Karáng-Hájie*, the eastern *Karáng-Brám:* the situation of both is marked on the nautical charts. Pursuing the coast of the island to the east, another projecting point occurs in this direction, called *Tánjong Tádá:* the bay between these two points is not very deep, and near the western portion an

extensive reef of rocks is met with, projecting beyond the surface, which from the number is called by the natives *Káráng Sáribu*. Nearly one mile to the east of this, at the discharge of the river Sukál above mentioned, is a small point, called by the same name. About half a mile to the west of Tánjong-Tádá, a remarkable reef of bluff rocks extends beyond it into the ocean, which is named *Batu-bedown*. Tánjong-Tádá is considered by the natives who frequent this coast in small prahus, as equally distant from the town of Minto and the mouth of the river of *Kutto-wáringin*.

The bay formed between point Tánjong-Tádá in the west, and point Tánjong *Ressám* in the east is more extensive than the former: the distance from the two extreme points is nearly 13 miles: it receives the river of *Dshering*, one of the largest of the island. The western portion, from the mouth of this river, is completely free from rocks; two small rivers, Ayer *Prátáp* and Ayer *Dsheyley* empty themselves into this bay between the mouth of Dshering river and Tánjong Tádá. About 3 miles to the eastward of point Tánjong Ressám, the village of Tampeláng is situated on a small river of the same name. A small island, *Sambubuáng*, lies on the coast south of the river and very readily directs to the settlements. After the smaller points of Tánjong *Ráyá*, Tánjong *Seleppu* and Tánjong *Djurung-pátt*, follows in the south-south-east the discharge of *Kutto-wáringin*, and, two miles further in the same direction, that of *Mendu-river*, as above related. Several small islands are met with on this part of the coast, the chief of which are Pulo *Meddáng* and Pulo *Antu* to the west of the discharge of Mendu river, about 2 miles from the shore.

The chief mountain in this division of the island is that of *Manumbing*, erroneously called Mánopin hill: it occupies almost the whole of the extreme western portion of this peninsula, and its descending sides extend towards the Bay of Minto in the south, and towards that of Jebus in the north; a hill of less elevation is united to it in the west which is called *Duláng pitja* and another Gunung (hill) *Kukus* in the east. The general direction of mount Mánumbing with its appendages is from west to east: a more de-

tailed description of a portion of it will follow in the mineralogical account of this part of the island.

At no great distance from the eastern appendage of Mánumbing, several low hills extend in the same direction, forming an interrupted range: the first of these, next to Kukus, is the hill *Murut*, which is followed by Gunung *Ketukul*, and, several miles further eastward, by Gunung Panjang.

Several other long extended ranges of low hills occur in the eastern parts of this division of the island, whose situation is not yet accurately determined: those I noticed at a considerable distance are the hills *Assám*, *Singgiri* and *Pándán* of the natives; besides numerous less considerable elevations, which will be mentioned in the Journal in the accounts of the districts inhabited by the mountain people.

The interior parts of this western portion of Banka are inhabited by the original race of the island, commonly called *mountain people*. Their chief retreats or villages to the south and west of Minto have been mentioned above. The other districts they inhabit are that of *Pisáng* between the mountain *Manumbing* in the west and *Márass* in the east; and that of *Kutto-waringin*, comprized between the mountain Márass in the north, the discharge of the Mendu river in the south, and the districts of Maráwáng and Pángkál-pináng in the east, the former is subdivided into the smaller districts of *Pungur*, *Dshering*, *Suk-kouw*, *Ketáppe* and *Empáng*, and the latter into those of *Deppá*, *Dshuruk*, *Grungáng*, *Kedialu*, *Nyalouw*, *Bákung*, *Maráss*, *Seká*, and *Dshempurá*. Their relative situation, as far as I was enabled to determine, will be pointed out on the map, and their extent of population, importance and mode of government, in the account of the original inhabitants.

The NORTHERN DIVISION of Bánká comprizes that portion of the island which is situated to the north of a line extended from the discharge of the river of Kámpák in a south-east direction, along the foot of the mountain of Márass, to the source of Maráwáng river, to its discharge. Part of the western and the northern and eastern coasts of this division are bounded by that part of the southern ex-

tremity of the China Sea, which forms the general boundary of the island, and encompasses those of the neighbourhood. The Bay of Klábbet subdivides it into two separate parts or peninsulas, one of which I have denominated the *western*, and the other the *eastern* peninsula: these will be described in succession, after those details which are of a general nature.

From the discharge of the river of Kámpák to point Tánjong Genting, the coast forms part of Jebus Bay; here, after the discharge of the river of Sungie-bulu, the only place of note is *Teluk Nepá*, the usual anchoring place for small vessels. Pursuing the direction of the northern coast to the eastward, we meet the following points and rivers, which I shall enumerate in succession, referring to the map for their relative situation and distance viz: northward of point Tánjong Genting, the river Sungie Bombong, point Tánjong Penyábong, the river Dsherinkat, point Tánjong Pamudsha or Pengudsha, an island of the same name, the outlet of the river Seká (in a bay between the last point and) point Tánjong Láyáng, point Tánjong Penámbáng, two islands Pulo *Prut* and Pulo *Keddik*, Pengámá river (sometimes called the river of Mámpáng) point Tánjong Máppet, the river Dshebu, a small river Sungie Munkus, the extreme northern point Tánjong Siángouw, and, after a short inclination of the coast E. S. E. the point Tánjong Mellállá, which terminates in the north-west the Bay of Klábbet.

Passing the entrance of the Bay, we meet at its north-east extremity the point Tánjong *Tadá*. About a mile, directly to the west of this lies the island Pulo *Penyuso*, (from which sometimes the whole bay takes its name) and which directs the course of vessels into it. Between Pulo Penyuso and Tánjong Tadá, lies a smaller island called *Pulo-Tánjong-Tadá*. Following the coast from this point to the east, about 9 miles, we meet the point Tánjong *Batu*, north of which lies a small island pulo *Mengkudu*, a deep bay between the last mentioned points, is little known, the extreme point in the north about 3 miles further east is Tánjong Krássák. The coast now takes nearly a south-east direction, and after a distance of nearly 15 miles, we meet the projecting point Tánjong Tuwing,

the bays and smaller points along the coast have not yet been determined. Several miles to the south of Tánjong Tuwing we find the island Pulo *Simbang* nearly opposite the discharge of the river of *Mapur*. A small point, to the west of the island is called Tánjong *Mapur*. After two less considerable points Tánjong *Bátu* and Tánjong *Láyang* follows the projecting point Tánjong *Ráyá* beyond which the coast return considerably to the west, and then pursues, upon the whole, a south-eastern course, in conformity to the general direction of the island, to the furtherest southern extremity. Between the two last mentioned points, Tánjong Raya in the south and Tánjong Láyáng in the north occurs the *Bay* of *Sungie-liát*, which will be noticed more particularly in another place.

The bay of *Klábbet* is frequently referred to in the affairs of Banka, and deserves some attention; the mines however, which at present remain in its vicinity are of secondary importance, and the bay appears to the writer, interesting chiefly for the purpose of carrying on an intercourse between the western and eastern settlements (or between Klábbet and Sungie-liát) by means of small vessels. A regular survey having been made of the bay, I refer to that for the necessary information relating to its importance and advantages in a nautical point of view: my object at present is to give a concise geographical account of it in connection with the other parts of the island.

The Bay of Klábbet consists of an *outer* and an *inner* bay, the latter is again subdivided by several projecting points. Its general direction is from north to south. The outer bay is comprized between point Tánjong Mellállá in the north-west point Tánjong Tadá in the north-east, point Tánjong Ru in the south-west and point Tánjong Mántung in the south-east: at the two last points the bay is considerably contracted, while the direction of the coast from Tánjong Ru to Tánjong Mellállá is upon the whole, north-west and north-east. Through the western portion of the bay is dispersed numerous rocks, some projecting beyond the surface others concealed: between the two extreme points of the eastern coast of the bay the direction is nearly directly north and south, and here the passage

is safe and open, being close to the western extremity of Pulo Pinyuso, the island above mentioned.

Between one and two miles north, a little east, of Tánjong Ru, are situated two small high rocky islands, called by the same name Pulo *Klápp*á. In taking a distant view of the numerous rocks dispersed through the western portion of the outer bay, many of them have the appearance of islands being partially covered with vegetation.

Along the eastern coast of the inner bay the most conspicuous points are Tánjong Luttong and Tánjong Sumut; and along the western coast Tánjong Sunur; the latter extends a considerable distance into the bay. (For a more distinct idea of the relative situation and distance of these different points, as well as of the river, to be enumerated in the sequel, I refer to the map.)

This bay receives a large supply of rivers form all the neighbouring districts, which I shall enumerate in succession, beginning at the eastern point of the inner bay, (Tánjong Mántung) A few miles to the east-south-east of this point we meet the outlet of the river of *Pandjie*, on a short, abrupt branch of which resembling more an inlet than a river on which the stockade and village of Belinyu are built; a few miles further south follows the river *Pandjie Kádjut*, both these are of moderate size. The rivers of *Rumpá* and *Dántá* are less considerable that of *Dje Luttung* is nearly of the same size as the river of Pándjie and that of *Lumut* is somewhat larger. Having passed the discharge of two small rivers, Sungie Terus and Sungie Selájouw, we meet, near the southern extremity of the bay the outlet of that of Sayang one of the largest of this part of the island.

Of the rivers which discharge themselves into the western portions of the bay those of *Tennum* of *Sembubur* of *Sepáng* and of *Anten* are most considerable, amongst which the smaller rivers of *Mánjang*, *Báhán*, *Menák*, *Kándis*, *Sewukko*, *Tengalang*, of *Slimpang* and *Bákki* flow likewise into the bay following the coast of the bay beyond Tánjong Ru, we meet in succession the outlets of the rivers *Gemuru*, *Semulud*, *Meleto*, *Klábbet*, *Jshupát*, *Nonok* and *Lemouw*.

The chief islands contained in the inner bay are Pulo *Mengkubung* nearly opposite to point Tánjong *Luttung*; Pulo *Nanas*, a small distance to the south-west of Tánjong *Ru*: Pulo *Meddáng* and Pulo *Kambing*, further west nearly opposite the discharge of the river of Anten. The island Pulo Dánte is situated between the points Tánjong Luttung and Tánjong Lumut, near the east, and Pulo *Bettung* near the west side of the bay.

Near its termination in the south, the inner bay is divided by Pulo *Mendik* in a direction nearly north and south, opposite the discharge of the river of Lumut; in the same direction, but further south, and a little westward, are the smaller islands Pulo *Burung*, Pulo *Báhán* and Pulo *Kemudi*.

A number of settlements both of the original inhabitants and of the Chinese, existed formerly along the outer and inner bay, they have all been deserted in consequence of the inroads of the pirates, except the following inconsiderable Chinese villages of Bettun near the discharge of the river Simbubur, and at Jennum and Porso.

Besides the rivers above mentioned, which discharge themselves into the Bay of Klábbet, the chief rivers of the western peninsula are those of Sungie-bulu, Sungie Bombáng, Sungie Dsherinkát, Sungie-Seká, Sungie Mámpáng or Pengáná, Sungie Dshebu, Sungie-Munkus and Sungie Pállá, they generally arise from the elevations of the central parts of this peninsula. The river of *Anten* has the same source; it discharges itself a few miles to the south of Tánjong Ru, from the convenience of its course, it is often followed by the natives in their intercourse between the western and eastern peninsula or between the settlement at Klábbet in one, and at Láyáng in the other. At Pángkál Anten, about 5 miles above the discharge are still the remains of a former establishment.

Of the principal rivers of the eastern peninsula which discharge themselves into the Bay of Klábbet those of *Pándjie* or *Belinyu* and of *Lumut* will be mentioned in the account of those settlements. The river of Láyáng empties itself into the southern extremity of this bay. Near the discharge and several miles of its course it is very wide and deep, and receives successive supplies from the small-

er rivers of the neighbouring country: its direction (with many intervening curves) is east inclining slightly to the south. It penetrates far into the eastern peninsula, and at the present period is interesting chiefly for the purpose above mentioned of carrying on an intercourse with the settlements of the opposite peninsula, as the mines of Láyáng are no longer worked.

The other rivers of the eastern peninsula are those of Mápur, Jeniáng, Sungie-liát, Bedukkán, Nipá, Robo and particularly that of Máráwang. This river, whose course I have followed in marking the boundary of the northern and western division of the island, rises from the mountain of Marass: after receiving the branches of Sungie Belálin, Sungie Belumbáng and Sungie Dshádu it passes the village of the Dipátti Bárin under the name of Sungie *Mábbed*. Below this, in its course towards the sea, it is generally called Sungie *Márawáng*, and receives from the districts bounding its northern banks the following branches: Sungie *Kándis* (from the direction of the stockade of Máráwáng) Sungie *Prawáng*, Sungie *Kudá*, Sungie *Trángbáláng*, Sungie *Murotue* and Sungie *Mengkowán*, and from the south, Sungie *Pánde*, Sungie *Penegáng*, Sungie *Pándák* (a considerable stream) and the river of *Pángkál-pináng*.

Of the mountains in the northern division of Bánká the mountain called Gunung *Márass* by the natives must be first mentioned. It is situated at the southern extremity of the Bay of Klábbet, nearly intermediate between the western and the eastern peninsula, in a desert almost inaccessible part of the island, which is only, in a few parts, inhabited by the mountain-people. It is both in height and extent the most considerable on the island, but, according to the report of the Chinese who have visited and examined its environs, it is of less importance than any other part, as no ore of tin has been found in its vicinity. It consists of two distinct summits, separated by a considerable excavation: each forming a long extended eminence. Its general direction is from west-north-west to east-south-east. The eastern portion sends off a long extended, low, range which stretches a considerable distance in the direction of the large mountain.

The other hills I shall mention only by name at present as they will recur in the mineralogical account. We observe, in the first place, the hill or mountain, Gunung *Pári-pári*, at the extreme western point of the western peninsula; its foot runs off to form Tanjong Genting. A few miles north of this: Gunung Penyábung, which forms a point of the same name. Further eastward the hills Gunung *Pássokkn*, Gunung *Rábá* and Gunung *Mánek* forming an irregular interrupted range from north to south: then the hill Gunung *Gánten* with a small appendage in the north called Gunung *Sápiding*, and in the south, Gunung *Krawis* running transversely through part of this peninsula.

At the extreme north-east point stands the hill Gunung *Mellallá* from which, after a short interruption, the hill of Klábbet takes a course nearly north-west and south-east. A ridge of hills proceeds in this direction bounding the west side of Klábbet bay, but on account of their distance from the present settlements they are but little known. The most conspicuous are Gunung *Empáng*, Gunung *Puso*, Gunung *Tembáng*, and Gunung *Tempessu*, besides the smaller hills near the eastern boundary of the district of Klabbet. *Mendárá* and *Melito*.

In the eastern peninsula the hills preserve, upon the whole, the same course from north-west to south-east. The first, commencing in the north, is the hill Gunung *Tuwing* with several separate appendages; it runs off to form the point of this name—more westward, and stretching further to the south, follows Gunung *Pándjie*, with different low peaks, pursuing the same direction. The hill Gunung *Puwák* with two appendages runs off at point Tánjong Rá-yá. Gunung *Bettung* inclines more to the interior. Gunung *Sámbong-giri*, and several miles further south Gunung *Keppu*, situated near the boundary of the south-east division of the island. Several less considerable hills will be mentioned in the mineralogical account.

The western peninsula is divided by the original inhabitants into the districts of Sungie *Bulu*, *Mámpáng*, *Tenga* and *Klabbet*: these are bounded in the south by the district of *Pesang* under the Batin

Sudin above mentioned. The district of Sungie-bulu is again subdivided into three smaller portions. Sungie-bulu, Lámpong and Telláng, which, with those of Mámpong and Tengá, are united under one common chief, the Batin of Sungie-bulu. Their population will appear in the general table, and their relative situation will as nearly as possible be pointed out on the map. The district of Klábbet has its particular native chief. In each of the above mentioned districts *mines* are at present worked: they mostly lie contiguous and occupy the central parts of the peninsula. The persons who superintend their affairs, receive and store the prepared metal, &c., reside at the chief villages of Sungie-bulu, Jebus, Klábbet and Mámgpáng, at each of which there is a stockade at its store houses and establishments proportionate to the works carried on.

The relative importance of these mines is in the following order:

1. Those under Jebus, they are divided through two districts called the *upper* and the *lower-furnace*.

The present stockade has been established within the last twenty years. The former establishment was at Anten, whence it has been removed to this place, in consequence of the greater convenience of its situation with reference to Plembáng.

2. Those under *Klabbet* in the district of Tenga: the present settlement is called *Klabbet-baru* in contra distinction to the former stockade and establishment at Klabbet-lámá above-mentioned.

3. Those of *Sungie-bulu*.

4. Those of *Mampang*; these have lately been opened near the northern coast of this peninsula near the discharge of the river of Seka.

The eastern peninsula is divided into the districts of *Belinyu*, *Lumut*, *Mapur*, *Sungie-liát* and *Marawang*; in all these the population of the original inhabitants is very inconsiderable. Those of *Belinyu* are considered as following the chief of Klabbet; those of *Pandjie* and *Mapur* are united to the district of Kutto-waringin; and those of *Marawang* and *Sungie-liat* have their own chiefs.

The mines of this peninsula are upon the whole less productive than those of the western: these which are at present worked are

dispersed through the district of Belinyu, Lumut, Sungie-liát and Márawang. Those of Layang have been relinquished, but the district of Mapur is expected to contain valuable mines: At the present period, those of Márawang and Sungie-liát are the most important.

In the district of Belinyu the principal mine is at *Towallam* about 4 miles from the stockade. The neighbourhood of *Pandjie* contained formerly considerable mines which are exhausted; but most of the miners have attached themselves to the spot and formed a village of the same name, on the river above mentioned, on a small branch of which the stockade of Belinyu is likewise built; both districts are united under one chief.

The stockade of Belinyu is laid out sufficiently extensive to contain, besides the store houses and dwellings of the chief, those of the artificers and other persons connected with the mines, the furnaces, and a number of private families. The former attacks of the pirates have made a retreat necessary at all the principal establishments, in the eastern peninsula particularly. At Lumut, Layang, Sungie-liat, Marawang and Pangkal-pinang these stockades are constructed on a similar plan, and contain the store houses, furnaces and the dwellings of various persons employed in the preparation of the metal. Smaller stockades are built at various other places as at Djeniang, Robo, Messu, Jirak &c.

The mines of *Lumut* are situated nearly at the same distance from the bay, about 3 miles further south: three large mines are at present worked, those of *Hapsun*, *Lahuntouw* and *Keighwad*. The attention of the miners has been strongly directed to *Mapur* about 10 miles towards east north east; which is supposed to offer a favourable opportunity of opening new and productive mines.

At *Layang* a considerable village of Chinese has remained, although the mines of that neighbourhood have been exhausted.

The mines of *Sungie-liat* are dispersed through the districts of Lampur, Ayer-Duriu, Robo, Roboklu, Djeniang and Ratta, for the relative situation of which I refer to the map, while the particulars which I noticed as to those I visited will be detailed in the Journal.

The mines of Marawang are situated in all directions about the stockade: the most important will be pointed out in the mineralogical account.

The SOUTH-EAST DIVISION of Banka, though the most important in point of extent is the least interesting at present as far as relates to population and productiveness. The line of boundary which separates it from the northern division has been mentioned above; in the other quarters it is surrounded by the common boundaries of the island already described.

The eastern coast, from the discharge of the Marawang river to point Tánjong Merikat, is bounded by the southern extremity of the China Sea, the straits of Gaspar, between the point last mentioned, and point Tánjong Merrun separates its furthest eastern extremity from the island of Billiton; in the south it is washed by the sea of Borneo or Java, and the Straits of Banka divides it in the west from Sumatra.

It contains the subdivisions of *Pangkal-pinang*, *Jerak*, *Koba*, *Tubuali*, *Banko-kutto* and *Paku*, each of which is made up of smaller districts.

The district of *Pangkal-pinang* is the only one which, as far as regards population and extent of works for preparing metal, is equal to most parts of the northern division of the island. In the north it is bounded by the large river of Marawang and in the west by the former settlements on Mendu-river, a line drawn from the source of the Selan river eastward to the discharge of that of Kurouw forms its southern boundary: In the east it takes in an extent of coast from the last river to that of Marawang.

The principal mines of Pangkal-pinang are distributed through the subdivisions of Messu, Brassak, Krassak-Ulu, Bakung, Bangkwang, Kayu-besse, Ayer Mangkok Bulu, Ayer Udang and Gumuru; the relative situation of which I have however not been able accurately to determine; they are mostly named according to the streams and rivulets which pass through them. The settlements of Pangkul and Kurouw, near the southern boundary of the districts, as well as several of the others just mentioned have participated in

the common disasters of the island and have almost been converted to a desert.

The original inhabitants are united under the native chiefs: the Batin *Marawang* (not to be confounded with the districts above-mentioned, Batin *Bukit*, Batin *Ayer-Angat*, Batin *Seluk* and Batin *Mendu*, whose district in divided into a western and eastern or Mendu *Barat* and Mendu *Timor*.

Jirak is a small district situated about 10 miles nearly south-west from Pangkal-pinang. It was formerly under the superintendence of Marawang, but from the contiguity of its situation, will more properly be added to Pangkal-pinang. Near the western boundary of this district are the two old settlements of *Pangkal-Mendu* and *Pangkal-Mangas*, situated on different branches of the Mendu river, the former towards the north, the latter towards the south: they have both been useful in keeping up a communication between the eastern and western parts of the island and from the latter to Minto. *Godong-Selan* lies 3 miles further south on a branch of the Selan river. Along part of its southern boundary the district of Pangkal-pinang meets that of Koba.

Koba extends along the eastern coast of Banka from the river of Kurouw, to point Tánjong Merikat, the south-east extremity of the island. It was formerly an important and productive district and supported numerous mines and prosperous establishments of the Chinese, its only inhabitants at present are a few straggling mountain people who have lately returned thither. The smaller settlements of *Rangouw*, and *Kayu-arro* formed part of this district.

Bounding the southern part of Koba in the west we meet the extensive district of *Tubuali*, commencing at its point of termination above mentioned. From here Tubuali follows the direction of the coast through the Strait of Lipar, comprising an extensive belt of this part of the island which, winding round the points Sarang Ikan and Sumbuang-dapor, proceeds along the western coast the termination of the district at the boundary of *Banko-kutto*. In the southern part of Tubuali in the Strait of Lipar are the two rivers of *Teng-*

kiya (also called *Ketia*, and *Keppu*,) well known by the report of the richness of the mines and as a resort of the smuggling prahus from Billiton.

The stockade of Tubuali is situated on a small river of the same name about 3 miles from the point Tanjong Sumbuang-dapur at the foot of the hill Bantilan. Pursuing the western coast about 20 miles, we meet the settlement of *Nyiree*, and 12 miles further northward that of *Ulim*. Both supported formerly considerable establishments and mines; during the late disasters of Bánká they have been nearly depopulated, but since the establishment of the present Government many of the exiles are gradually returning to their former homes.

The mountain people of Tubuali are united under the Batins or chiefs of *Semámbu* and *Grungáng*. To the north of the district we meet that of *Bánko-kutto*. It extends from the boundary of Ulim along the western coast of the island to the discharge of Mendu river, and comprizes the smaller settlements of *Bálar*, *Kábal*, *Permissáng*, *Bánko-kutto* and *Penágan*.

The old settlements of Bánko-kutto were situated about 7 miles up the river of the same name. The reports of the natives agree in affirming that these were in ancient times the chief establishments on the islands ; and that the representatives of the former foreigners af Banka resided at a fortified place, the ruins of which are said to be evident at the present time. *Pángkal-bulo* is a settlement about 6 miles higher up the same river near the central districts, it is conveniently situated for carrying on a communication across the island towards Kobá, and in former periods served for this purpose. All the subdivisions of Bánko-Kutto retain at the present period scarcely a remnant of a considerable population; their relative situation has been laid down on the map.

The district of *Páku* is one of the most extensive of this part of Banka, and possessed formerly a population proportioned to its extent, this appears from the number of working men (*Mátta-gawes*) which were apportioned from the inhabitants, for the works of the Sultans of Plembang in former times. Those few fugitives who escaped the general devastation, have retired to Pangkal-pinang and

Máráwang where they were less exposed. A nominal Dipatti of Páku still resides at present near Jirák.

The district of Paku occupies the central parts of the island included between Pangkal-pinang and Kobá in the east and Tubuali and Bánko-kutto in the west; and from its extent may be supposed to contain valuable mines; it has been less visited than other parts, by the Chinese miners. The inhabitants, in former times prepared *Iron*, from the ore which is abundantly found in this district, in a manner similar to that of the inhabitants of Billiton. Their chief article of manufactory consisted in nails.

My opportunities for collecting practical observations have been very limited in this part of the island: the only districts I visited were those of Pangkal-pinang and Jirák, where my continuance was very short. I have therefore little to add as to the rivers, mountains, points &c. of this division. According to the reports of the natives, the largest rivers are those of Kobá, Keppu, Bánko-kutto and Selan; the others have the same name as the settlements which are formed on them, and which have already been mentioned. The situation of those from Selan to Tubuali has been laid down on the map, as they were pointed out by the natives, in sailing along that part of the coast. Several projecting points occur near the southern extremity of Bánká the principal of which are, Tánjong *Merikát*, Tánjong *Ru*, Tánjong *Merrun*, Tánjong *Sárang-ikán* and Tánjong *Sumbuáng-dápur*. Near the boundary of the western division we meet the points Tánjong *Penagán* opposite the Nanka islands, Tánjong *Kúbal*, several miles south of Permissang near the settlements of the same name, and Tánjong *Udshung-pángong* distinguished on the maps by the denomination of Lalary point.

The principal mountain of the district of Pangkal-pinang is called Gunung *Mángkul* its southern extremity Gunung Ládi, runs off towards the east and forms the point Tánjong Udshung-Gunung, near the discharge of the river of Pángkul: some remarks on its constitution will follow in the mineralogical account. A very considerable mountain, equal in length to the Máráss, but less elevated, the Gunung *Páding* occurs in the district of Kobá, and its promontories

form the point Tánjong Merikát: it is distinctly perceived in sailing through the Straits of Bánká.

In the district of Tubuáli I only determined the hill Gunung Bántilán, remarkable for its pyramidal form, immediately east of point Tánjong Sumbuáng-dápur: the names of several long extended ridges in the district, could not be learned from those natives to whom my enquiries were directed.

The hill of *Permisság* in the district of the same name, is noticed by every person who passes the Straits of Bánká. It is nearly equal to the Mánumbing in height, but its declivities are more extended and give it a longer appearance: several small ranges are attached to it in the north and the south opposite the Nánká islands, the hill Gunung *Penagán* is very conspicuous: it runs off to form a point of the same name.

SECTION II.

MINERALOGICAL DESCRIPTION OF THE ISLAND.*

After the foregoing geographical description of Bánká, I proceed to a connected narrative of the mineralogical appearances, remarks and facts, in order to explain the constitution of the mines and to throw some light on the geological history of the island, reserving the most obvious conclusions and reflexions until the observations made in different parts of the island have been detailed, and may be taken into one point of view.

But, for the purpose of elucidating the following descriptions, it is necessary to premise some remarks or positions of a general nature.

1. The direction of the island (see the geographical account) is from north-west, to south-east: in this direction it follows, not only the neighbouring island of Sumatra and the peninsula of Malaka, but the large chain of the Asiatic mountains one of the various branches of which terminates in Ceylon, while another after having traversed Arracan, Pegu, Malaka and probably Sumatra, sends off an inferior range through Bánká and Billiton where it may be considered to disappear and terminate.†

2. It is not only in the direction of its course that Bánká follows the large Asiatic ranges of mountains,—the elevated parts of the island, or those which are entitled to be called mountains or hills, have the same constitution as the great chain above mentioned, they are composed principally of *granite*.

3. Next to these, which must be considered as the primitive parts of Bánká, we meet with a species of rock, which for the sake of distinction I have named Red-Iron-stone. It is very extensive-

* We beg to call the attention of all our readers who are interested in our Settlements on the Malay Peninsula to the extreme importance of this part of the Report. So great is the resemblance of Banka to the southern countries of the Peninsula that there is hardly a page of the mineralogical description which may not be applied to some parts of the latter.—Ed.

† See Sketch of the Physical Geography and Geology of the Malay Peninsula, *ante* p. 89-93. also vol. i. p. 2-1.—Ed.

ly distributed and occurs in situations of secondary elevation, in single rocks, or in veins of many united together, and covering extensive tracts of country. The red colour universally predominates, and it contains a large proportion of Iron in its composition, but a more particular accounts of its distribution and conjunction with other parts of the Island, is one of the chief subjects of the following description: the analysis will be added separately.

4. In many parts of the Island, these tracts of country, which are composed of Red-Iron-stone, are bounded by the *alluvial* districts which are again subdivided into such as are formed of ranges of waving hills, gradually rising on each other, apparently of prior formation, and of such as are completely low and level, of recent origin, and confining the discharge of the large rivers.

5. In conjunction and often within the alluvial tracts are found sand-stones, breccias (or amygdaloids) and various mixed stones, bearing marks of a comparatively late origin. The former is generally distributed in extensive veins or low ridges; the breccias or amygdaloids occur in a great variety of form and disposition. Immense conchoidal or tabular masses, in some instances, cover extensive portions of the ground.

6. Those districts which occur in juxtaposition to the primitive portions, filling the space between these and the fixed veins of Red-Iron-stone (Iron-rock), or again between these and the alluvial parts, are *stratified:* the strata are uniformly horizontally arranged, and characteristic of the tracts above mentioned which form the basis of the Island.

7. The *ore of tin* is disseminated through these horizontal strata, and, as far as has hitherto been remarked, either immediately under the surface or at no great distance below it: they are mostly found in low situations or near the primitive ridges: The process of mining has greatly contributed to illustrate their composition, and it is one chief object in the following details to give a clear account of the component parts of the strata, in as far as these were illustrated by the various fragments of stone found at the aqueducts of the mines.

8. Forming part of these strata and distributed through the more

solid parts, are extensive masses of *Clay* of various colours, from pure white to yellow and red: a black earthy substance which, for the sake of distinction, I have called *Black-clay* occurs in irregular masses or *coagula* (with few exceptions) in every mine; and the termination of a stratum is indicated by a peculiar white clayey substance which becomes friable by drying and is called *Kongtay* by the Chinese.

I have proposed in the mineralogical remarks, to follow the order in which they were made during a tour through part of the Island of Bánká, without any retrospect to regularity or relative importance; dating the commencement of my investigations from my arrival at Kámpák in March after a passage of two days from the settlement at Rángám. In my course around the western extremity of Bánká, during which the vessel remained near the shore, I had a good opportunity of observing the direction and extent of the mountain Mánumbing and its western and eastern appendages, with part of that range which extends from it, to the eastward.

That tract of country which lines the Bay of Jebus between the hills of Pári-pári on the north, and of Mánumbing and its appendages on the south, must be considered as one of the Alluvial districts of Bánká; besides several others of less note, the rivers of Sungeibulo, Kámpák, Pálangás and Rámbát pass through it. In proceeding up the river of Kámpák I remarked numerous rocks projecting beyond the surface.

I examined them at a cluster, which forms a small Island, called by the natives *Bátu-lukut*, about 100 yards in circumference. The external form of the entire rocks is rather rounded than sharp; the highest project, at the present season, about 10 feet beyond the level of the river: The external colour of the separate rock is of a dirty hue; the surface is very unequal and rough, excavated by fissures, crossing each other in various directions, into irregular angles and rhombs &c. or marked, in a similar manner by white streaks or lines. The fracture is intensely white, some portions appearing glistening as pure quartz, others dull and chalky.

When struck with an hammer it separates at the fissures, which appear on the surface, into irregular fragments; it also frequently follows the direction of the streaks or lines: these are formed of a substance hard and semi-transparent, approaching the nature of rock-crystal. They often separate from the common mass of the stone into extensive laminæ of unequal thickness from half a line to a quarter of an inch: In many cases, however, they are closely united to the substance of the rock, they appear on the fracture but cannot be separated. This rock is completely siliceous, and exhibits not the least sensibility on the application of the strong acids.

The village of *Kámpák* is situated about half a mile from the discharge of this river; the banks are here elevated about 12 or 15 feet above its common level at low water. After some search I discovered a spot where they were exposed by an artificial section; they here consisted of a stratum of the red-iron-stone formed of fragments of various figures, from the size of a pea to that of several inches in length and diameter, disposed in very fine sand adhering partially by means of particles of clay; they were all rounded at their edges and bore the marks of having been carried down by the stream. Alternating with this stratum, and in some instances immediately under the soil, I remarked extensive masses of clay of a reddish ground, variegated with yellow and white; small fragments of red-stone were often bedded in it.

From Kámpák the direction of the river is winding through the alluvial plain to its third branch which leads to the stockade of Jebus; the profuseness of vegetation along the whole course, extending completely to the water edge, prevents an accurate examination of the banks; in several places where they were exposed they exhibited a black vegetable mould. The stockade of Jebus is built on the first elevation beyond the level of the river: I examined the fragments of stone which were thrown out in making the ditch which surrounds it; they are of the same kind as those found near the river at the village of Kámpák, small Red-Iron-stones all bearing the marks of attrition, corroded on the surface, flat, oblong reniform, variously excavated, perforated and rounded, the fracture exhibited a red or

brown oxide of iron of different shades, the surface was covered with a yellow ochreous crust.*

The country from the stockade of Jebus to the district of the mines is waving and uneven, but as it is completely covered with wood and vegetables it is difficult to form an opinion of the relative height of the intervening hills, which may more properly be called risings. I noted thirteen in succession on this tract.

In the descent after the first rising, large rocks of red-iron-stone projected from the surface, or were dispersed in large fragments on the road: The fracture is very various; in some fragments it is metallic, in others ochreous or mixed: those of the former (the metallic fracture) are of a dark brown colour, stratified or cellular, the excavations exhibiting a dark shining surface as resembling a substance which has undergone a fusion and has suddenly cooled: the ochreous fracture is generally porous and the colour intensely red. Both are a rich Iron ore, and their analysis and accurate description will be given in the sequel.

The nine following vallies exhibited similar appearance: The Red-Iron-stone in great variety; and *sand*, apparently of different colours, from the clayey particles that are accidentally mixed with it: several of them transmit rivulets, others bear the marks of an accumulation of water after rains.

In the ascent after leaving the tenth valley the road crosses a very extensive layer of *sand-stone*. The colour, in general, is light blue or inclining to grey; some parts are covered with a yellowish ochreous crust. It is divided or separated by rightlined fissures which appear on the surface in delicate lines or streaks crossing each other in various directions: when struck, it separates at these lines, in fragments of every variety of configuration, with flat sides and sharp angles, forming squares, lozenges, pyramids and oblique parallelograms in endless variety. The adhesion of its particles, in its natural situation, is not strong and many portions are friable, by dry-

* The disintegrated ironmasked rocks of the Peninsula are extremely deceptive in this respect, often appearing like water worn gravel, volcanic lapilli, &c.—ED.

ing, it acquires a considerable degree of hardness. On this layer of sandstone I found, dispersed in various parts, loose fragments of a substance purely siliceous, consisting of minute crystals of quartz closely united into a brittle strong mass, divided and separating by regular fissures, but mostly in planes or slabs with even surfaces. In the eleventh and twelfth valley are dispersed large loose fragments of red-iron-stone, similar to that above described: they both transmit small rivulets. After the thirteenth descent follows that district in which the mines are at present worked. Its boundaries and extent cannot be defined, but the most productive strata of tin-ore have been found near the central parts of this peninsula at the junction of the districts of Sungie-bulu, Klábbet and Tengá, embracing an irregularly oval space whose longest diameter is about six miles, sending off arms in various directions, particularly towards *Klábbet-lámá* or to the north east. Towards the north and north-east the plain is surrounded by the ranges of hills above mentioned; in the south-west and south, it unites with the alluvial hills, which stretch obliquely across this part of the island, and its south and south-east extremities extend to that extensive desert, which surrounds the mountain of Márass, and which has imperfectly been investigated.

This district, upon the whole, is level or variegated with very gentle risings: but like most parts of Bánká it is so completely covered with vegetation, that in no place a large extent of surface can be taken into view at once.

Of all the mines that are worked at present, in this district, those of Jebus or Anten are the most considerable; they are divided, according to their situation, into those of the *Upper-furnace*, and of the *Lower-furnace*, in the former two, and in the latter three large mines are worked at present, besides ten *small* ones distributed through both districts.

The large mines of the Upper-furnace district are those of *Sungie Tángo* and *Suntáy*, and of the Lower-furnace district, those of *Sungie-Buláh*, *Táynám* and *Seám:* the ten small mines of both districts are those of *Sunko*, *Sunyu*, *Sunsing*, *Sunwad*, *Sunwing*, *Sunhawa*, *Soktjoy*, *Tenpo*, *Assun*, and *Atshey*.

The first mine, near the southern boundary of the district which I examined was that of Sungie-Bulák, named after a river of the same name; the ground in the neighbourhood has been worked, nearly for thirty successive years.

As the manner in which the business of mining is conducted on Bánká, will be minutely described in the sequel, I shall, at present only premise, introductory to the description of the appearances which I noticed under the surface, that, in large mines, the ground is perforated by a square or oblong excavation or pit from which the successive layers are carried out by the workmen until they arrive at the stratum which contains the ore of tin. These strata, as has already been remarked, are all disposed horizontally and, comparatively, at no great distance below the surface; extensive tracts of ground are thus, in many places, worked and exposed in succession. In this place particularly, where the stratum had been found very productive, I observed the remains of a great number of pits from which the ore had been extracted.

In the pit on which the workmen were at the time employed. I noticed the following successive strata:

On the west side

No.	1.	Stratum, black vegetable mould.....	1 ft.
	2.	Sand and yellow clay loosely mixed....	1 ,,
	3.	Black clay, an extensive irregular mass unqual in depth from.....	6 to 8 ft.
	4.	Coarse white sand.....	3 ,,

On the north side

	1.	Stratum, black vegetable mould.....	1 ,,
	2.	Sand disposed in dark coloured clay (irgular)	3 ,,
	3.	Black clay, variegated with narrow strata of yellow clay; irregular massive...	5 to 6 ,,
	4.	Coarse sand	3 ,,

On the south side

	1.	Stratum, vegetable mould.....	1 ,,

2. Sand mixed with mould (containing trunks of trees in a recumbent position ; and perforated by deep roots) . 9 feet.
3. Yellow clay in small irregular layers alternating with dark coloured sand . 1 foot.
4. White clay. . . . . 6 in.
5. Black clay massive . . . . . 1 foot.
6. Coarse sand.

The miners were at this time engaged in carrying out these different strata; they had penetrated nearly 14 feet below the surface, and from the disposition of the vein of ore, with which they were acquainted by the experience of the last pit, they expected to arrive at it after having descended about 6 feet more. On the surface remaining exposed from the former works, I observed very large fragments of a glistening white stone consisting of quartz and felspar mixed nearly in equal proportions. Some of them had more than twelve inches in diameter. If force was applied they separated at fissures into fragments with regular sides. They had remained after the *washing of the ore;* the fragments of stone which remain, after this process, at the sides of the canals or aqueducts, demonstrate clearly the composition of the stratum in which the ore is found, and I made it a rule to examine them in every mine I visited, and to collect specimens of the varieties.

At this place I found, besides the large fragment above mentioned smaller particles, diminishing gradually to the weight of a few grains of the same kind ; they all had a disposition to separate into fragments with regular angles. In some cases the particles of felspar were in a state of decomposition and formed a white powder resembling chalk : it was not in the least affected on the applications of the strong acids : Small crystals of pure quartz were mixed with this white powder.

Besides these, I found at the aqueduct, sand-stone in small fragments, resembling that above described. An aggregate stone or amygdaloid in laminæ, composed of particles of quartz united by a yellow, ochreous Iron-earth ; to several of these the particles of tin-

ore were still found adhering, and irregular fragments and crystals of pure quartz of various shades of colour.

In proceeding from the district of the Lower to the Upper-furnace one perceives, on the road, the vestiges of many of the old mines; they form a contrast, though by no means a pleasant one, with the abundant vegetation of the Island: the places of the small mines present a naked uneven surface, covered with the remains of the former works, to which the shining particles of quartz mixed with the sand impart a peculiar aridity: the place of the large mines is known by extensive chasms alternating with irregular hillocks. It requires however, but a short time in Bánká, to cover the whole with fresh vegetation, and in a few years the spots where the mines were worked are converted again into forests.

The mine of *Sungei-Túngo*, is the most important of those of the Upper-furnace; it employs more workmen than any other single mine on the Island, and produces, in one season, more metal. The stratification of the excavation is very regular: it consists, under the soil, of alternate layers of sand and clay of various colours, between which the Black-clay occurs in extensive irregular masses. The lowest stratum, containing the ore, had been lately carried out, and was collected in a large heap preparatory to the process of washing.

I collected at this heap a great variety of the stones which had composed the stratum of which I shall only mention the chief, as the other varieties will be successively pointed out in the description of the mines.

1. Quartz, regularly crystallized but opaque.

2. Felspar in irregular rhomboidal fragments, mostly with flat sides and sharp angles, pure, or mixed with minute particles of quartz.

3. Felspar and quartz alternating in nearly regular strata, or disposed so as to produce a marbled (variegated) surface: often in fragments of considerable size.

4. Pure quartz, massive.

5. A lamellated stone consisting of minute crystals of quartz, united to a friable mass with regular surfaces.

6. Quartz and felspar mixed nearly in equal proportion, the

latter in a state of decomposition. In some specimens the crystals of quartz are very minute, and these resemble a white sand-stone.

7. An aggregate stone consisting of very minute, or of larger fragments of quartz, united to an amygdaloid by a gluten of ochres of various colours, from light yellow to dark red: it occurs in laminæ of various forms and a great variety in the admixture of component parts, in some instances minute particles of tin-ore are closely adhering to the fragments.

8. Argillaceous Iron-ore, of dark brown colour, particles of quartz closely adhering to the surface, which in many parts are covered with yellow ochre.

9. Almost pure clay of a grey colour in masses.

10. Large masses of a white substance which is considered by the Chinese miners as an unequivocal indication of the termination of a stratum of ore, the name is *Kongtay*. It is of the purest white colour, very light and adheres strongly to the tongue, it possesses all the properties of pure clay; and the manner in which it is found, demonstrates plainly that it is a deposition from water. On this the ore of tin is composed in strata differing in richness and extent and mixed with the various kinds of stone which are from time to time enumerated in the account of the mines.

The mines of Sungei Tángo, as well as those of Sungei Bulák above mentioned, have been worked for many successive years, and their neighbourhood forms the most extensive, naked tracts of the country in this part of the Island.

Proceeding from here to *Klábbet* the road leads almost in a western direction through a most luxuriant forest, the soil of which consists of a thick black vegetable mould.

The most important mine in this district is that of *Sinkin*, it employs 32 workmen and is the second in productiveness of those at present worked in Bánká. I found the miners within 6 feet of the stratum of ore: they were engaged in carrying out the earth from an extensive pit of an oblong form.

On one of the sides I remarked the following succession of strata:

1. Vegetable mould.

2. Black-clay in extensive masses abruptly and irregularly interposed between the other strata.
3. Fine whitish sand (with a small proportion of clay intermixed.)

On another of the sides I remarked

1. Soil.
2. Black-clay massive.
3. Sand adhering partially by means of a clayey cement.
4. Pure white sand.

The difference between the two last mentioned layers was very evident, in the third the proportion of clay was very abundant, and united the particles of pure white sand to a mass which became solid by drying. The fourth was a pure sand consisting of minute crystals of quartz most of which were transparent, in distinction from the other it was perfectly loose without any adhesion of its particles.

The manner in which the black clay is generally interposed or intruded between the other strata deserves some attention, but will more properly be considered elsewhere.

Most of the varieties of stone collected at the aqueducts of the mines of the Upper and Lower-furnace, were found here likewise; and besides those above enumerated, I collected.

1. A species of siliceous stone of the fracture and apparent qualities of hornstone.
2. Felspar of a most pure and beautiful milk white colour.
3. An amygdaloid consisting of white and coloured siliceous particles, considerably resembling porphyry in the fracture. Many of the masses of quartz, at this mine, had the colour of amethyst.

On the road to this mine (of Sinhin) somewhat nearer the stockade of Klábbet, I visited the small mine of *Tshentel*. As the difference between a *small* mine and a *large* mine will be pointed out in another place I shall only remark at present, that in small mines the stratum of ore is generally nearer the surface, and that they are worked, comparatively, with few hands.

This mine was opened on an inclining ground. Immediately un-

der the soil, which was 2 feet deep, I remarked a mixture consisting of small fragments of quartz deposited in a clayey substance of a white colour, which, where it had been exposed to the air, was chalky and adhered to and coloured the hands. The ore of tin was dispersed through the whole of this stratum, commencing immediately under the soil, where it was not perceived by the eye, but became evident on exposing it to the process of washing; about 8 or 10 feet below the surface it became very evident by a black discoloration of the stratum, making a striking contrast with the particles of quartz. It was also plainly perceived by its weight when taken up, and some of the lower parts of the stratum were very rich.

In the neighbourhood of this mine, which had been exposed by former works, I found the following substances:

1. Quartz and felspar in a state of incipient decomposition: the crystals of the former were wedgeshaped, very brittle, easily separated, if force was applied, when the decomposed felspar appeared as a white friable powder; they were united into tables or slabs mostly with oblique surfaces.

2. Quartz and felspar united into masses of nearly equal proportions of admixture, to a substance of a variegated fracture (as above described.)

3. Amygdaloids consisting of the stone just mentioned united to small portions of the red Iron-stone by a clayey cement.

4. Black shining sand combined with particles of quartz by means of a ferruginous cement. Besides the sandstone above described, and various combinations of clay and sand.

The mines of *Sunnie* are situated near the northern boundary of the district of the mines above mentioned. They are of the *large* kind: the workmen had, at the time of my visit nearly arrived at the commencement of the stratum containing the ore, after having penetrated:

1. A stratum of soil . . . . . 2 feet.
2. White clay mixed with a small proportion of sand, co-agulable to a solid mass by drying . . . 3 ,,
3. Coarse sand, consisting chiefly of fragments of

crystals of quartz in some places, intervening small masses of clay . . . . . 2 feet.

4. Black-clay massive in irregular co-agula . . . . . 2 „

5. Fine sand, dispersed through particles of quartz and fragments of decomposed granite-rocks: here the ore commenced to be thinly disseminated through the stratum, the lowest portion of the layer which had been carried out from the last pit adjoining to the present work, had consisted of very large fragments of decomposed granite, through which the ore had been plentifully dispersed. The miners informed me that the vein of ore on which they had been employed for 3 years, and which occupied the lowest part of the valley, had several times intersected the course of the river which flows through it.

Of the peculiarities of the stones which I found at the aqueducts of this mine I shall only enumerate the following. The crystals of quartz had mostly a tapering wedge-like form, they were opaque though apparently pure in their nature. The felspar separated in rhomboidal masses, and was of various shades of colour: some of the fragments were very beautiful. I remarked for the first time schorl in elegant needle form crystals adhering to the fragments of quartz: it was also often combined with quartz to an imperfect granitello: the schorl in these cases was distributed through the quartz in nearly equal proportions, in small irregularly rhomboidal crystals; the substance of this combination was very loose and friable.

The *amygdaloid*, consisting of a mixture of Red-Iron-stone with particles of quartz and felspar, in various proportions, so common in the mines of the Upper and Lower-furnace and of Klábbet, was not found among the stones of the aqueducts of the mines of Sunnie, or it existed to sparingly that it eluded my attentive search. The remarks which I made in my further course to the northern-coast of Bánká, explained this circumstance. The mine of *Sunnie*, as above marked, is situated near the northern boundary of that portion of this peninsula, which I have called the district of the mines. Several hills, which form an irregular ridge, bound this district in the north. The chief of those is called by the natives Gu-

nung *Gánten*, which has two appendages, one, Gunung *Sápiding* to the north, the other Gunung *Kruwis* to the south, from the latter two smaller hills Gunuug *Rábá* and Gunung *Mánek*, extend towards the western extremity of this peninsula, and in some degree connect this ridge, with the hills above mentioned, Gunung Pári-pári and Gunung Penyábung. The Gunung *Pássukkán* deviates from this irregular transverse ridge and runs off in the north towards the point Tánjong Pámudjá.

The general appearance of these hills has nothing particular : the form of Gunung Gánten is irregularly conical and somewhat elevated, the others are extended and low : they are all completely covered with vegetation.

The country at the foot of these hills is more elevated than the district towards the south, and no ore of tin has hitherto been discovered in it ; as the ground declines towards Seká, Mámpáng, Dshebu point Pámudjá, and other situations near the northern confines of the island, the strata containing the ore of this metal are again found at the usual distance below the surface.

The remarks, to which my route through this part of the island directed, appeared to me of importance in its Geological History. The objects of mineralogy which I had hitherto met with, were those of the lower or alluvial district at Kámpák, at Jebus, on the road to district of the Lower and Upper-furnace, at the aqueducts of the mines and in the strata which had been exposed by the process of mining. The latter were evidently of a mixed nature, and consisted of detached portions of larger rocks of different kinds, removed out of their natural situation, and exhibiting unequivocal marks of having been carried along and subjected to attrition by a current of water, On my track from the mines of Sunnie to Mámpáng, I was gratified, for the first time, by the discovery of a rock of granite in its original situation, in the midst of a forest and almost concealed by a thick coast of mass. This directed my attention to the hill Gánten, with its appendages, which was near on the road. I found that the rock which forms the basis of this hill is of the same kind.

In the specimens of granite which I collected from this hill, the mica is, upon the whole, very sparingly distributed, the fragments of quartz are of very different sizes, from that of the smallest grain, to crystals nearly an inch in length, the felspar is mixed with the other parts in large oblong or rhomboidal fragments which are mostly easily separated, and in many portions occupy the greatest proportion of the mass. In some portions minute particles of schorl are barely perceptible, in some these are uniformly mixed with the substance of the stone, in others none are to be discovered.

Between the foot of the hill Gánten and the Settlements at Mámpáng I met with more large rocks near the road; in some places several of them occurred together; the descent hither from the central district is very gradual, and the highest top of the Ganung Gánten, the largest of the transverse ridge, cannot, according to my estimate, much exceed 500 feet above the level of the sea. From the settlement, I proceeded about 2 miles, nearly in an eastern direction to the district of the mines. On this tract which is on an average less than 2 miles distant from the northern shore of the island, I met again numerous granite rocks, forming large groups and rising precipitous many feet high, often with regular sides and sharp angles, resembling in a great measure irregular basalts. Through the district of the mines, these rocks were dispersed very abundantly. From the mines I proceeded, nearly in a northern direction to the stockade, which was lately established here for the security of the miners. It is built on the extremity of a point or promontory, at the foot of which the river of Seká discharges itself into the sea; the spot is completely naked, and the rocks present themselves of their natural colour, which in the forests is not distinguishable on account of the mass with which they are enveloped. Not only the extremity of this point, is covered with large rocks, but they are seen to extend into the ocean as far as the eye can reach. Their form is highly diversified and they exhibit almost every possible variety in which granite is produced: many rise with sharp peaks to an enormous height; others are low, large and rounded on the surface: The most are collected in groups rising to a considerable height with more or less

regular sides and angles, and exhibit a sample of crystallization on a large scale. In the site of the stockade, I observed several separate rocks with uncommonly regular sides and angles. A most extensive group is placed almost directly before the mouth of the river: it consists of a high pile of huge rocks forming a longitudinal series, in which masses of a variety of configurations are thrown on each other, with so much regularity as to exhibit the appearance of art having assisted in their arrangement.

The colour of the rocks is almost entirely derived from the felspar which enters into their composition: this substance is observed on the surface or often projecting beyond it, in regular foursided crystals or in rhomboidal plains: the form of both however is considerably diversified. In some instances these crystals have the length of several inches and are nearly one inch wide; they shew themselves still more distinctly on the fracture of the stone. The quartz is likewise observed on the surface, but is distributed, on the whole, in much smaller proportion than the felspar: both contribute to give the granite the white appearance above mentioned, which varies however from almost pure milky white to that of grey. In all the rocks which I examined and of which I collected specimens, the mica was, upon the whole, sparingly distributed, and the only occasional admixture was schorl in very small proportion.

The mines of Mámpáng have been opened within the last two years near a small river called *Tengalow*, which discharges itself into the ocean, a little east of Seká: they are situated in the granite district, about one mile from the northern shore of the island. The miners (at the mine *Sunwad)* had met the layer of ore about 10 feet below the surface, it was situated in a valley, and pursued nearly the same direction as the bed of the river, which was directed from its course, and employed for the purpose of washing the ore, as an aqueduct.

I noticed the following strata:

1. Soil . . . . . 2½ feet.
2. A mixture of fine particles of quartz and clay . . 4 „
3. Detached coarse particles of quartz and felspar

with a small portion of clay and some sand 3 „
at the bottom of this stratum the particles of Tin-ore become perceptible.

4. Coarse fragments of quartz and felspar with small particles of schorl, this contained the ore of tin: at the termination the workmen produced to me the white friable substance above mentioned, called Kongtay by the Chinese.

At another side of the mine:

1. Soil.

2. Coarse sand, composed of particles of quartz bedded alternately in red and in yellow clay: with masses or coagula of black clay, protruded irregularly into the stratum.

3. Fragments of quartz and felspar, occasionally with adventitious masses of clay: upon this followed the stratum of ore, as in the last stratum, above mentioned.

The stones which I collected at the aqueduct of this mine were not much diversified—as the working of the mine had very lately commenced, they were inconsiderable in quantity and consisted chiefly of fragments of felspar and quartz of various sizes and figures; no amygdaloids occurred here, nor did I remark any vestige of Red-Ironstone in the neighbourhood.

Having extended my mineralogical remarks to the northern coast of this peninsula, I determined, after my return to the stockade of Klábbet, to inspect the south-western extremity of the district of the mines, in the direction of Sungie-bulu, which settlement I had not yet visited. At the Lower-furnace the road separates from the common route to Jebus and takes a more westerly direction. Here very extensive surfaces are exposed from which the ore has been successively extracted, chiefly by the process of *small mining*. The road passes through or near most of the small mines above enumerated. In one of the mines, near the boundary of this district, I noticed the following strata, which have been exposed on the side of a hill by the usual mode of working these mines.

1. Soil..... $1\frac{1}{8}$ feet.

2. A deep layer of sand of a yellow colour, owing to

the clay which was mixed with it. . . . . 6 „

3. Fragments of siliceous stones mixed with amygdaloids, in this stratum the ore of tin was dispersed, at the bottom of which

4. A layer of white earth; extensive surfaces of which remained exposed on the grounds from which the other layers had been removed.

On examining the stones which remained at the aqueducts I was forcibly struck with the abundance of amygdaloids, which were mixed with the siliceous fragments and which made a striking contrast with the appearances observed only a few days before at the mines of Mámpáng. These amygdaloids appear to have been accumulated in particular strata, as I observed in some places most of the stones that remained after the washing of the ore were of this nature.

At a small distance from the mine which is at present worked I found a large vein of Red-Iron-stone: Those parts which projected from the surface formed several extensive rocks in a half recumbent position. The fracture is similar to that of the same stone found on the road from Jebus to Klábbet, above mentioned, partly ochreous, partly metallic. It appears, by its gravity, to contain a large proportion of Iron. Not far from this rock were several loose fragments of a sandstone of a fine grain and reddish colour, marked and crossed by very regular lines of different shades. From this mine I proceeded to the village of the Bátin or native chief of the district of Sungie-bulu: the course of the road had hitherto been nearly westward; it now took a more southern direction. About a mile beyond the Bátin's village I passed an extensive track covered with Red-Iron-stone, the principal rocks were fixed and projected considerably beyond the surface: The specimens collected, resemble those found at the mine last described. They contain a large proportion of Iron.

The mines of *Táyu* belonging to Sungie-bulu and those of *Táynám* and *Seám*, are situated at the south-west extremity of the district of the mines, at no great distance from the road. I passed along an extensive aqueduct of the mine of Táyu, which had lately

been constructed. Having left the district of the mines the road leads through a thick forest, the soil of which is a deep, black, vegetable mould. The country is on the whole descending. Besides several extensive veins consisting of fixed rocks of Red-Iron-stone, I observed fragments of this stone wherever the stratum of soil was removed by a current of water. In the stockade of Sungie-bulu were collected several large fragments of Sand-stone, of the same colour and constitution as that found at the last mine above mentioned: upon examination I found that they were brought from the foot of the hill Pári-pári, where this kind of stone is found in abundance. I obtained by means of the natives several specimens from their natural situation. The stockade of Sungie-bulu is built in the alluvial district, the confines of which will more accurately be pointed out in future.

I proceeded from here to Kámpák in order to take a more accurate view of the lower parts of the peninsula in this direction, and to trace at different points their boundary with the more elevated districts. Having crossed the Sungie-bulu river, the road proceeds through a low plain, several parts of which are partially inundated: to this succeeds a gentle rising on which I observed several large detached fragments of Red-Iron-stone of the same consistence and colour as the others found near Jebus, above mentioned. After several successive risings, which were covered with a deep soil I met with a valley the lower part of which transmits one of the branches of the river of Kámpák. The sides, of which the descent was considerable, were in several places excavated by streams of water: I examined the materials of which the valley is composed: in different excavations, which exposed a depth of several feet. I here found small fragments of Iron-stone as far as I could penetrate below the surface, exactly resembling those at the outlet of the river of Kámpák, and at the hill on which the stockade of Jebus is built. They all bear the marks of having been carried along (charie) by a current; they are rounded, variously excavated on the surface, and covered with an ochreous crust. Their fracture exhibits them of the same constitution as the first Red-Iron-stone which composes the

greatest part of the base of this part of the island : most of them contain Iron in great proportion. The opposite ascent of the valley consists of similar fragments of the same kind of stone, and in the further course to Kámpák, I observed it in several successive vallies disposed in the same manner. The last part of the road passes through a marsh the greatest part of which is overflowed at high-water. It admits a passage with considerable difficulty : this the traveller must seek over the trunks of trees which accidentally lie in the way, and which have in some measure been united by the natives, by slender bridges, consisting of several long poles placed near each other.

The hills consisting of rounded stones form the boundary between the purely alluvial districts of the island and those of the secondary nature which are formed of more fixed materials, Red-Iron-stone, Sand-stone &c., and contain those strata through which the ore of tin is distributed, and which are mixed with fragments from the higher districts, but the extent of each and their junction with each other, as far as I have been able to ascertain, will more properly be pointed out when the account of the mineralogical appearances in different parts of the island is completed.

The general direction of the road from the present stockade at Klábbet to Klábbet-lámá, the old settlement at the bay of this name, is E. N. E. After leaving the immediate environs of those mines which are at present worked, the road passes through a thick forest about six miles, when one meets the remains of the mines attached to the former settlement. The country on this track is low and the ore of the former mines appears to have been contained in strata, which were in conjunction with those which afford the present mines in the central parts of this Peninsula.

The thickness of the soil on the road to the old settlement, prevents in most cases a view of the surface : In one place only I remarked fragments of Red-Iron-stone near the road.

As the ground near the bay was successively exhausted the miners followed the strata to the central district : the spaces of the old mines are generally covered, at the present period, with fresh vegetation, and it is only in a few instances that the substances which have been

exposed by the process of mining can be observed on the surface: Fragments of quartz and felspar are dispersed over a surface of sand which is coloured yellow or red according to the adventitious particles of clay; amygdaloids are also observed in considerable abundance.

The remarks which I made at this old settlement deserve some attention. The river of Klábbet discharges itself through a valley which has a general direction from west to east: on the declivities of this valley, at the distance of about one mile from the sea, the dwellings of a number of Chinese families are built near the site of the old stockade, which was on a gently rising ground at a small distance from the valley.

I examined the sides of the valley in different places where the ground had been cut through perpendicularly by the Chinese for the purpose of fixing their habitations: the layers were very similar to those I had seen in several mines. Immediately under the soil was a layer of coarse sand, consisting of particles of quartz of different sizes, which were loosely agglutinated by clay of varying shades of colour from light yellow to red: the quantity of clay was sufficient to give to the particles of sand a considerable degree of adhesion. In several large masses which had been detached from this layer, in different places, near its lower termination, I noticed an appearance which had not occurred to me before. Amygdaloids of the kind of those above described which I had found in various parts of this peninsula, consisting of Red-Iron-stone clay and sand were here in a state of complete decomposition: Being divided by a cutting instrument, which was easily effected, the Red-stone, which enters into their composition was completely exposed, with the particles of quartz distributed through it: those portions which had been preserved some time in a dry place had become loose and friable. A section of one of these amygdaloids exhibited an appearance very different from the stratum of transparent sand agglutinated by means of red coloured clay, which has several times been mentioned; it was truly characteristic of the nature of this aggregate, while in large masses the manner in which the amygdaloids were imbedded in the

stratum was clearly demonstrated. At the extremity of this valley near the sea, numerous large granite rocks single or collected in clusters project from the surface: their external appearance is similar to those near the northern shore of the peninsula but less diversified by the felspar on the surface. In the composition of those which I examined the component parts appeared to be in more equable proportion and more equally distributed.

The hill of Klábbet which rises immediately to the north of the valley above described is also composed of granite; and the numerous rocks which diversify the bay, and which have given a basis to several islands consist of the same kind of stone.

I observed near the dwelling of one of the Chinese in the valley, a fragment of granite which had been brought hither from the sea, in a state of decomposition or separation of its component parts: it exhibited strikingly the appearance I had remarked in many of the stones taken from the strata of the mines, the felspar was changed into a white clayey mass in which the particles of quartz were imbedded of various sizes.

As it is inconsistent with the rule I have originally laid down, to mix reflexions of a theoretical nature with an essay which is intended to be purely descriptive, I shall make no other remark than that the valley above mentioned may be considered as the boundary (in this part of the peninsula) of that district in which the strata of tin-ore are arranged, and which takes hence a western course until it meets the alluvial hills near the stockade of Sungie-bulu. Most parts of this district are unquestionably stratified; the chief layers are formed of *sand*, the particles of which are of different sizes, but always transparent or semi-transparent, of the nature of quartz: these are united by clay of different shades of colour formed from the decomposed felspar. Next to these are often deposited fragments of *Red-Iron-stone*, which occurs in extensive veins and forms a considerable proportion of the fixed parts of this district. The separated particles of the primitive rocks which abound in many parts of this peninsula enter also into these strata: from their magnitude and weight they generally occupy the lowest part and through them the

tin-ore is disseminated. The nature of the *black-clay*, which I have observed with but one or two exceptions in every mine I visited, and which is, at it were obtruded into the more regular strata, as an irregular coagulum, essentially different from the superficial vegetable mould or from the other masses of pure clay which abound, deserves to be more accurately investigated and explained.

In the NORTHERN DIVISION of the Island of Bánká the hills are divided into two separate ranges, one near the western the other inclining towards the eastern boundary, between which an extensive space remains which is occupied by the Bay of Klábbet.

This bay has, upon the whole, the same direction as the general range of hills, from north-west (or N. N. W.) to south-east (or S. S. E.) it is terminated in the south by the mountain of Márass: in the geographical account, the northern part of the island has been divided into two peninsulas according to the division naturally formed by this bay.

The mineralogical appearances in the western range and its environs having been described, I proceed to the detail of those in the eastern. The rocks which project beyond the surface at the shores of the bay, as well as those dispersed through the entire western portion are granite: I examined them in my course through the bay at numerous points. The constitution of the islands of Pulo-Klappá near the points Tánjong-Ru and Tánjong Mántung, which separate the outer from the inner bay, and which nearly meet each other from the west and from the east, is of the same kind: they are both immense piles of granite rocks, similar to those above described, on which vegetation has commenced.

The gradual inclination or meeting of the declivities of both ranges of hills towards the west from the eastern, and towards the east from the western, is evident not only by the excavation which is filled up by the bay but also by the course and discharge of the numerous rivers from both sides and which have been accurately enumerated in the geographical description of the island.

I had an opportunity only of examining the eastern confines of the bay. Between the projecting points or promontories of the hills,

bounding the outlets of the rivers there remains a considerable alluvial tract: and the district of the mines, commences towards the sides of the hills from the boundary of the bay.

Beginning in the north near Tánjong Mántung we meet the outlet of the river of *Pánjie* flowing into the inner bay, a small branch (but which is considerably dilated by the influx of the tide) takes a somewhat northern direction, on this the stockade of Belinyu is built, at no great distance from the promontory which runs off from the central range and forms the point Tánjong Mántung. Hence I proceeded in a northern direction to the district of the mines.

On leaving the stockade a long extended hill is observed towards the central parts of the peninsula, which was pointed out to me as Gunung Pánjie (or Pántjie) beyond which the highest parts of the Gunung Towing are occasionally observable stretching towards the south-east.

The road on leaving the stockade is slightly ascending and the country soon becomes waving. About a mile north of the stockade I observed the first granite rocks: they soon became numerous on both sides of the road, and some of them were of considerable size. One in particular attracted my notice. It stood alone, the form was irregularly conical, the top tabular, and the sides, about half way down, regularly excavated by the gradual operation of the descending water after rains.

Most of these rocks, like those at Mámpáng were marked with felspar, in large parallelograms and squares. On several parts of the road I found loose rounded fragments of Red-Iron-stone, similar to those collected in the alluvial districts above mentioned, but I remarked none in fixed rocks.

The district of the mines is situated north of the stockade: they have been worked for many successive years and extensive surfaces remain exposed.

The mine at present worked is at Towállám: the pit was regularly oblong. I noticed at different sides the following strata.

In the south

1. Stratum vegetable mould ..... 1½ feet.

2. Black-clay, massive as observed in the other mines ..... 8 feet.
3. Clay of a greyish colour containing a small proportion of sand..... 4 ,,
4. Black-clay, irregular massive ..... 6 ,,
5. Coarse sand in transparent grains bedded in pure white clay..... 3 ,,

This extended to near the stratum containing the ore of tin. One of the miners with a long crow-bar raised a portion of it and produced to me some of the ore of tin: they were employed in carrying out the last mentioned stratum.

In the west.

1. Stratum, vegetable mould.
2. Black-clay, massive.
3. Sand in clay of a grey colour.
4. White sand.
5. Beautiful white sand (of transparent siliceous particles) and clay.
6. Sand bedded in yellow clay.
7. Sand in dark bluish clay. The last three layers were less regularly horizontal in their disposition, than the layers of sand in many other mines; they had considerable inclination.
8. Loose white sand.
9. Yellow sand, coloured with particles of clay, but scarcely adhering; on this followed:
10. The stratum of coarse fragments of decomposed granite, and of breccias through which the ore of tin was disseminated.

None of the mines I visited afforded me a more beautiful and distinct view of the succession of the strata, or more explanatory of their arrangement. The pit on which the workmen were employed had been formed with uncommon neatness, and by means of the abundance of the clayey particles the sides had remained completely regular and perpendicular. The last layer (No 9 just mentioned) of yellow sand contained delicate streaks of the ore of a black colour. (consisting of very minute particles) which became evident when it

was divided by a sharp cutting instrument: these streaks were not completely regular or uniform, some were horizontal, others had a gentle inclination, they indicated the approach of the stratum which next followed, consisting of larger quantities of the ore distributed through the coarser fragments of decomposed granite rocks, which from the appearance of the stones brought up by the last works contain, or are intersected by veins of Red-Iron-stone. The stratum on which the miners were now employed was considerably extensive, spreading in all directions round the mine.

Among the substances which remained from former works near this pit I remarked:

1. Large fragments of siliceous rock of the same kind with that described above, found at the mines of Sungie-Bulak.

2. *Kongtáy* or white friable earth, remaining at the bottom of the stratum, near the termination of the tin-ore.

3. *Amygdaloids* or *Breccias* these particularly attracted my notice: many of the masses had the constitution of the *Red-Iron-stone*: others were aggregate. Although I had found numerous loose fragments of the common Red-stone on the road to these mines, an attentive search had discovered to me none in large or fixed rocks. The fragments which were collected here, shewed plainly that the miners in taking out the stratum containing the ore, had encountered extensive veins: and they informed me that the blocks which I examined, and which were abundantly strewed over the surface, had been taken from some of the latest pits.

They differed in appearance considerably from the Red-Iron-stone found in the environs of Jebus and Klábbet. The stone was much more compact and ponderous. The fracture had mostly a metallic lustre, varying in shades of colour but without the cellulosities above mentioned.

It was generally covered with a yellow or red ochreous crust, and some portions were completely converted into a yellow or red ochre; but particles of quartz were in all instances perceived on the solid massess or in the friable calx. Some of the smaller fragments, and those particularly taken from the aqueducts were more purely Brec-

cias, consisting of coarse siliceous fragments united by a ferruginous-cement: to many of these the ore of tin was still found adhering in very minute particles. From Belinyu to Pándjie the country is on the whole alluvial. I observed one granite rock projecting from a branch of the river: the stones which have been collected by the inhabitants of Pándjie for various purposes are explanatory of those found in the neighbourhood; they consisted of fragments of granite and of Red-Iron-rock. The mines of Pándjie were situated towards the hill of that name which has been marked on the map.

That part of this peninsula which, bounding the bay in the east, stretches from the stockade and environs of Belinyu and Pándjie towards the foot of the Gunung Márass is alluvial. The stockade of Lumut is situated in it, a considerable distance up the river of that name and near the eastern confines of this tract; in proceeding to it from the usual landing place the road passes several elevations which here bound the alluvial plain. These consist of Red-Iron-stone in separate rocks and in large veins covering extensive surfaces. Loose fragments are also dispersed on the road. Those rocks which I examined more minutely and from which I collected specimens, were more similar to those of Jebus and Klábbet than those found at the mines of Towállám just mentioned.

They are mostly cellular and the fracture is partly ochreous and partly metallic: the separate particles of some of them are very ponderous.

These hills formerly contained strata of ore which has successively been extracted: on approaching the stockade one passes the remains of many of the former mines. Here the surface is covered with mixed stones; fragments of granite, breccia and coarse sand, similar to those found at the aqueducts, are strewed on the sides of the road in every direction. From the stockade of Lumut the district of the mines stretches northward inclining to the west until it meets that of Pándjie and Belinyu.

I commenced the examination of the mines of Lumut about half a mile to the north of the stockade at one of the small mines which had lately been relinquished. The process had been carried on as

usual on a slightly inclining ground. A vertical section exposed the strata of the hill, and the extensive surface below contained the remains of many former works.

On the side of of the hill I noticed.

1. (Layer) soil
2. Sand
3. Coarse sand, consisting of large particles of quartz.
4. Clay of a reddish colour.
5. Coarse sand.
6. Clay.

7 Extremity of the layer from which the ore had been extracted: the fragments which composed it were chiefly siliceous, of the mixed kind above described, consisting nearly of equal proportions of quartz and felspar combined into a variegated mass.

The succession of strata was very distinctly exhibited in this mine; the lowest was peculiarly characteristic and afforded me an opportuty of observing a vertical section of the stratum containing the ore in its natural situation: the fragments which composed it could be separately removed; they were of different sizes from less than an inch to several inches in diameter.

Although it was evident that they consisted of portions of the decomposed, or disseminated primitive rocks of the surrounding districts their present arrangement shewed that they had undergone a revolution and had been removed out of the natural situation. A considerable proportion of the felspar was in a state of decomposition and appeared as a clayey substance, to these the particles of tin-ore often adhered. Grains of sand were mixed, but in comparatively small quantity, with the coarse fragments which formed the stratum.

The surface which had been exposed by the successive works of this mine was very extensive; they had been commenced in a low situation, and the productiveness of the stratum had gradually diminished as the acclivity of the hill increased: the miners, supposing it to be near its termination, had given up the work. The stones which remained here resembled those usually found at the aqueducts. The

abundance and size of the fragments of Red-Iron-stone and Poudingues shewed here, as at Towállám, that the miners had met with extensive veins of this stone.

The next mine is situated two miles further north ; form the chief miner who administers the work it is called Hopsun. On the road to it, I passed extensive districts which had formerly been worked. Large fragments of Iron-stone and Poudingues were abundantly dispersed over this tract : they were mostly detached and had been removed from their natural situation by the process of mining and by the formation of canals. The veins from which they were taken had in many instances run near the surface. In this mine I noticed the following strata :

1. Soil.
2. Sand bedded in clay of a grey colour.
3. Black-clay.
4. Coarse white sand.

The stones at the aqueducts were fragments of the common siliceous kind, large and mostly of a white colour : very few breccias were mixed with them.

In the next mine call Lakuntouw situated about half a mile east-north-east of the last mentioned, I found the strata.

1. Soil.
2. Sand bedded in whitish clay.
3. Sand in dark coloured clay.
4. Sand in bands of variegated colours.
5. Black-clay.
6. White sand.

The stones at the aqueducts resembled those found at the last mine ; they contained, comparatively few amygdaloids or breccias : those which occurred resembled those of the mine of Belinyu. They were ponderous ; silicious particles appeared on the fracture alternating with portions of a metallic lustre, and the surface was ochreous. A few consisted of minute particles approaching the nature of sandstone.

The mineralogical appearances in the two districts last described

were very similar to those of the western peninsula of this division of the island. This similarity was displayed, not only in the arrangement of the strata, but particularly in their relative proximity to the surface: it likewise appeared in the constitution of the more fixed parts of the island. Various circumstances did not permit me, in this part of the island, to extend my reseaches to the range of central hills; but the promontories which descend from them towards the west and form Tánjong Mántung (which I passed in proceeding to the mines of Belinyu) as well as extensive districts in the neighbourhood, are covered with large piles of granite rocks. Numerous veins of Red-Iron-stone have been discovered below the surface at the mines of Belinyu, and in the vicinity of Lumut we meet extensive hills, composed of them, and which are in immediate conjunction with the alluvial plains above mentioned bounding the Bay of Klábbet.

The northern portion of this peninsula up to point Tánjong Tádá is completely unknown; nor can I say any thing from personal observation of that tract which bounds the central range of hill in the east, extending from point Tánjong Tuwing to the confines of Sungie-liat; but the information I obtained from various natives at Belinyu and Lumut tends to shew that many portions of it are stratified like the districts of the mines on the west side of the range of hills: and from trials made during my residence on Banka, it appeared that these strata contain a sufficient quantity of the ore of tin to encourage an attempt for extracting it. The district of Mápur is in this situation, and it is followed in the south by that of Dsheniáng, in which mines are at present worked that are under the superintendence of Sungie-liát. As to the districts of Belinyu and Lumut, it is proved by the daily trials at present instituted to obtain productive situations, that the richest strata have been exhausted in the course of above 40 years successive mining.

(To be continued)

THE GEOGRAPHICAL GROUP OF BORNEO.*

(Continued from p. 371.)

CHAP. II.

Notices on the Statistics of Borneo.—Limits of the subject or dependant countries.—Precis of the States of the west coast.—The Chinese.—Precis of the States of the south and east coasts.—Sketch of the domains of the independent Princes.

THE indiciæ relative to statistics do not yet rest upon positive and official facts; we offer such as it has been possible to derive from the reports of the employés of the government of India, who have filled different missions in some of the possessions of the state on Borneo.

A very vague estimate makes the presumed number of all the inhabitants of Borneo, not comprising those of the islands of the geographical group, 3,000,000; but this estimate appears to me exaggerated, because it is certain that those portions of the interior for which we have been able to obtain indiciæ are very thinly peopled; with relation particularly to the considerable extent of those districts which only reckon a small number of hordes established along the rivers; some low parts exposed to inundations of rivers and large lakes in the interior are wholly uninhabited; the country along the coasts is generally low and the formation alluvial; the immense extent of the wooded deltas which stretch many miles from the mouths of the rivers, which intersect the country in all directions, make a large part of the southern, western and eastern coasts, are only inhabitable during certain seasons of the year, and when the rivers have retired to their beds; during these periods they may serve for the temporary sojourn of some nomadic hordes. The elevated parts of the interior, those occupied by chains of high mountains whence proceed the great bodies of water which the numerous rivers bear to the sea, are still unknown to us; they should not, consequently, enter into the calcu-

* Translated from Temminck's Coup d'Oeil General sur les Possessions Neerlandaises dans l'Inde Archipelagique, tome 2d. Leide, 1847.

lation with which we are occupied. Restricting ourselves, then to those parts of Borneo on which we can found an estimate of the population: in the first place the towns and villages in the possessions of the state and in those of the dependent princes lying on the three sides above mentioned; secondly the possessions upon all the northern coast such as we find divided between the Sultans of Bruni or Borneo proper and of Sulu, as well as the state of Sarawak: thirdly, the borders of the very numerous streams, rivers and lakes, as well as the countries of the interior still unknown; fourthly, the inhabited tracts along the coast. But, if we allow this circuit to embrace the approximative number of three millions of inhabitants, we can only do so by attributing a very large population to the northern parts of the island, which is not probable nor even admissable, because of the small number of inhabitants which a more exact calculation, based on the consumption of salt, appears to yield in the possessions of the state and dependent princes; countries of which the superficies occupies two thirds of the island, and of which the population nevertheless will not reach the number of 1,350,000 souls; leaving thus 1,650,000 souls for the population of the remaining third of Borneo, which does not appear very probable.

We find in the memoirs of the commissioner Tobias, under date the 30th of November 1825, that the approximate population of the residency of the west coast, exclusive of Europeans whose number is not given, was as follows:

Malays and Arabs	134,946 souls
Bugis	11,360
Dependent Dáyáks	237,720
Chinese	36,074
Independent Dáyáks	80,000
Total	590,100 souls

In 1836 the single principal district of Pontianak, a dependent portion and chief place of the above residency, was reckoned to contain:

Europeans	22
Arabs	319
Malays	3,001
Bugis	2,211
Dáyáks	13,391
Chinese	17,693
Total,	36,637 souls.

The population of Sambas, Succádaná, Mátán, Lándák, Mámpáwá, the tract upon the rivers Kápuás and Meláwí as well as many other small states dependent on this Residency are not mentioned in this notice.

The most recent data relative to the population of the extensive countries which form the Residency of the southern and eastern coasts occur in the administrative reports of the years 1836, 1837 and 1838: let it be well understood that all these data are merely approximations.

Colonel Henrici gives by estimate to the states subject to the Sultan of Banjermassing a population of	60,000 souls
To the possessions of Government in that state	40,000
It may be admitted that the state of Banjermassing contains independent Dáyáks to the number of	500,000
The states of Mándáwei, Sámpit and Pámbuán,	45,000
Pásir, Kuti and Berow,	45,000
The great and small Dáyáks,	40,000
Kotoringin, Sintáng, Dáwi and Djeli,	5,500
Págátán, Tánábumbái, Bátulitjin and Láut,	1,100
The islands along the coast,	22,000
Approximative population of this Residency,	758,600
Ditto ditto of the West coast,	590,100
Total of dependent States,	1,348,700

The want of certain data for the elevated parts and the mountain chains of the centre of the island, forces us to remain silent respecting this immense extent of country, the knowledge of which offers the greatest interest for science, and which ought to repay with usury the advances made by government for a regular and systematic exploration of this vast portion of its possessions. The Dutch Major G. Müller, whose loss is deplored by science, and who was assassinated with all his escort in the mountainous districts of the states of Kuti, if he had succeeded in his project of traversing Borneo from east to west,* would have been able, at the same time, to furnish exact notions necessary for the success of a scientific exploration of these savage countries.

In the first periods of the occupation of some portions of this island by the Company of the East Indies, this occupation, as in other parts of the Archipelago, had no other end than the possession of factories established at different points of the coasts. Since those times, on Borneo, as in all other places where it fixed itself with a purely mercantile end, the Company found itself constrained by circumstances, as well as by events to which these gave birth, to increase its power and extend its possessions; this continual augmentation of territory obliged this association of merchants to consider the means of establishing a civil administration. They very quickly appreciated these means of arrogating power and concluding treaties with the native princes their neighbours. Some real or supposed infractions of these conventions drove them to the alternative of seeing themselves despoiled of these fine possessions or of defending them by arms; it was thus that peaceable traders became soldiers. The fortune of war proving favorable to them, they profited by it, always for the interests of commerce, to augment their influence and impose their rule around their principal factories. Thus acting, they were elevated into the position of masters, almost without perceiving it, and they became, without wishing it, the arbiters of the lot and the

* This project has recently been resumed and carried into effect by Dr. Schwaner who, in the course of his journey, visited the place of Major Muller's murder, *ante* p. xvi.—ED.

destinies of many princes, as well as the rulers of vast countries, while large populations were subjected to their laws. The fine and flourishing possessions which the Company of the Indies bequeathed to the government of the Netherlands, owed their origin to this principle, which prevailed amongst the members of this mercantile society. This precious heritage acquired by the state, has been since augmented in territorial extent, and its power has been consolidated, extended and strengthened by victories and by treaties.

Borneo is not the least important part of the possessions in the Indian Archipelago which the present government owes to the courageous perseverance of our forefathers. To convince the reader of this, we shall describe the dispositions which Governor General Rochussen is making for territorial organization in this island: this indication of boundaries will serve to introduce a historical sketch of the most remarkable states which depend immediately and mediately on the Netherlands.

A Resolution of the Minister of State, Governor-General of Netherlands India, dated 28th February 1846, has decided that the southern, eastern and western sides of the island of Borneo, where Netherlands authorities are established, shall form a particular government, and in consequence has appointed Mr. A. L. Weddik GOVERNOR OF BORNEO.

The Resolution is as follows:

BUITENZORG, *the 28th February*, 1846,

THE MINISTER OF STATE,

GOVERNOR GENERAL OF NETHERLANDS INDIA,

Considering, that the exertions employed for more than 25 years, to raise the native population of Borneo from the neglected state in which they live, and effectually suppress Piracies, have not proved sufficiently successful; chiefly from want of combination, and because these exertions have been more determinately limited to the coast, where the Netherlands functionaries reside, and where their endeavours are often impeded by opposing interests.

Taking into consideration that, to stimulate industry and to extend civilization, the removal of impediments to trade and the establishment of Free-ports have already been tried without success; and that in consequence of this it has been deemed advisable by maintaining, and, if required, enlarging these liberal Regulations, to unite the now existing but separated and independently acting Netherlands Authorities, into one systematic co-operation through means of a central Government, which, once established in the interior, shall be able to put itself in immediate connection with the natives of the country, whose protection, moral and religious civilization, will be the aim of the proposed measures.

Considering that the mission sent lately to Borneo, has diffused more light regarding the system of Government, industry and commerce, by which the resources which this island offers, may be brought to be more and more serviceable to the general interest.

Considering that the general knowledge of the geographical and political concerns of Borneo obtained by means of the said mission, affords the means of defining the territorial division of the island; which will prevent any uncertainty concerning the judicial territory, to which the inhabitants of Borneo belong, and which will also serve as a rule for the tribunals and authorities:—without however intending to diminish or to restrict in any way by this description of frontiers, the pretensions which the Netherlands may be able to establish to any lands or districts lying without those mentioned below.

The Council of India having heard,

Has found good and determined:

1st.—To order, that the present independent divisions, over which Dutch authorities are placed on the South and East Coast, also on the West Coast of Borneo, with all their internal and other dependencies, shall henceforward be included in one general Government of Borneo and its Dependencies.

2nd.—To nominate as Governor of Borneo, A. L. Weddik, now Inspecting Commissioner of that Island and of Rhio and Linga, with the intention that he shall establish himself at a central place in the interior to be afterwards fixed, and that his sphere of

operations will be determined by instructions to be further settled.

To write to the functionaries now exercising authority in Borneo, to remain in exercise of their authority on the present footing over the interior and coasts falling under their division, till further orders shall have been given, with the understanding, that they will follow and obey the orders of the Governor of Borneo now appointed.

3rd—To order, that the following territorial division, and description of the Districts of Borneo, which are subjected to the Netherlands Sovereignty, shall serve as a guide for the measures of the Dutch Authorities established on that island.

1st—The west coast of Borneo consists of the Assistant Residencies of Sámbás and Pontiánák.

a.—The division of Sámbás contains the coast territories from Tánjong Dátu, to the mouth of the Sungie Durie.

Under it are the following islands, viz :—

Pulo Báhru,
„ Lombukután,
„ Penáták besár and ketjil,
„ Kábong,
„ Sáluwár;
„ Lándiás,
„ Piká,
„ Pontiánák,
„ Kámbáng,
„ Tuwáh, } near Pálo.
and „ Gáding }

Further in the interior, from the top of the Pángie mountains, being the high country of Tánjong Dátu, over the tops of the chain of mountains Kuwái and the mountains Djángui, Rájá and Gubáng to the mountain Bájáng also called Krimbáng, Bárátjeh and Sunjáng.

Further, from the hill Bájáng to the Sebáhu and in the mountain Pándán, to the Sebákkál and the Sempuru, and from Pándján, along the left bank of the Sungei Durie to the sea.

Under the government of Sámbás belongs only the territory of that name.

b.—The division of Pontiánák contains the coast territory from the mouth of the Sungei Durie, towards the south, to the hill Penámpungáng (on the south coast) and from thence right to the sea, which hill forms the frontier, between Mátám, and Kutto-wáringin. Under it belong the following islands, viz:—

Pulo Setienjáng, Dámer, Penembungon, Temádju, Dátu, Kumbáng, Máláng Márákiet, Nánás, Antu, Mássá-tiega, Kárimátá, Togong Perángien, Togong Kráwáng, Semur, Umáh, Aijer, Ubáng, Páppán (four islands) Máládáng, (three islands) Mentiegie, Láják Besár and Ketjil, Pándán Besár and Ketjil, Lessing, Grissek, Bántángur, Genting, Bessie, Burong (two islands), (Auwer, two islands), Aroh láut and dárát, Serutu, Bilián, Bussong, Gunung, Genteng, Sorong-gáding, Bulu (two islands), Bulát Kebájáng, Kerrá, Lintáng, Bákkou besár and ketjil, Kárimátá tuwáh, Buwán, Nibon, Sokot, Uloi, Melápies (four islands), Buleh, Genting, Sirih, Panámbángán, Trussán Hádjie, Lemán, (four islands), Pelintuán, Sálánámá, Dátu, Djoántá, Kátung, Penjám, Nibung, Láláng, Agun Pisáng, Sámbádien láut and dárát, Tjámpedák láut and dárát, Tjibeh, Tjambedák south, Lánggier, Pánánggon, Tjukus, Tukáng mángkudán, Sáwie, Djámboh, Kutjing, Nánás, Lukutkerrá, Djerás, Lángán, Báuwát, Geiláng, Penámbun, Mángkob and Bátu titie.

Further the frontier with Sámbás, as abovementioned, from the mouth of the Sungei Durie to the mountain Báyáng.

Further on, the frontier of the subject and allied states along the *Kápuás* with the Brunái kingdom, with some exceptions to be afterwards shown, and under reservation of the high Government right of the state to parts not occupied, is provisionally considered to go, from the mountain Báyáng over the tops of the mountains from which, in the North, rise the rivers which pour themselves out on the Brunái coast, and from which at the same time the rivers rise which fall into the Kápuás.

Further, over the chain of mountains Bátu Lupárt and over the mountains from which the left branch of Kápuás, and thewaters flowing into it, rise;—further in an East and North East direction to the high water-dividing central mountains which form the interi-

or frontier of Berou, where it is cut by the parallel of 3° 20' North latitude.

The realm of Pontiánák, with the exception of detailed directions afterwards to be given, is further limited by the mountains which form the interior frontier of Berou ;—and on the South, by the chain of mountains, Angá Angá, where it unites itself with the chain known under the name of Keminting (Mádái or Punám) from which chain, on the north, the waters originate which pour themselves out in the Kápuás, and, on the south, those waters which discharge themselves on the south coast of Borneo ;—afterwards over the before named chain of mountains going in the direction of south, west, and west south west to the mountain Páháringán bádákh, towards the mountain Bátu Hádjie, the Penámpungán, and from thence to the coast in a straight line.

Under the Realm of Pontiánák are included the districts :—

Pontiánák, Mámpáwá, Lándákh, Kubu, Simpáng, Sukádáná, Mátám, Táján, Meliouw, Sángouw, Sekádouw, Sintáng, Meláwie, Sepápu, Blitáng, Silát, Sálimbáuw, Piássá, Jongkong, Bunut, Málor, Támán, Ketán, Punán,

and a number of nomade races of Dáyáks, who reside in the above described territory.

Among the realms or districts here above mentioned, Sámbás, Mámpáwá, Pontiánák, Lándák, Kubu, Simpáng, Sukádáná, and Mátám belong directly to the Netherlands,—the remaining ones belong to it indirectly.

2nd.—Until the organization of the East coast shall have taken place, the states and countries situated in it, will remain combined with the south coast, and this division will contain the south and east coast, which also consists of the coast territories from the west of the river Kutto-wáringin (as fixed above by Pontiánák) East North East, and Northwards to the kampong Atás, making the frontier of the realm Bulángán to Berou, with the country of Tidun ; and situated nearly in 3° 20' north latitude

The following islands belong to it viz :—

Pulo Dámár.

Pulo Dátu
„ Láut and dependencies,
„ Láut, little,
the Moressen,
the Dwaalder,
Pulo Nángká and the islands on the Coast
„ Meáng,
„ Mátáká,
„ Bilang bilángán,
„ Báli kukup,
„ Mánitará,
„ Pánjáng,
„ Deráwán,
„ Robá,
„ Sámámá,
„ Tábá,
„ Kákábáng, and
„ Márátuwá.

In the interior, as shown in the division Pontiánák, from the union of the chain of mountains Angá Angá and Keminting to the west and west by south-west to the frontier of the state Kutto-wáringin.

In this territory is situated the realm of Bánjármássin, an independent state, a very near ally and subjected to the Netherlands jurisdiction as far as concerns foreign Asiatics and Europeans;—Its frontiers are as follows:—

Along the northern bank of the Kwin, crossing the river Mártápurá, along the Sungei Mesá, the source of the Sungei Báhru and Lumbákh; from thence along Támbák Linik towards Liáng-ángán, and along the right bank of the Mertuá, to the mountain Peméton, over the tops of the chain of mountains separating the waters towards the mountain Lángopán, and from thence towards the Luáng (all belonging to the chain of mountains Merátus) from the Luáng along the source of the Sungeis Sentálán, Ajun, and Nájun, and the Sungeis Náppo, Sibáng and Pákkon, to the place called Nánjon and from there to over against the Kwállá Mengkátip.

From over against the kwállá Mengkátip along the eastern bank of the river of Banjármassin to the Tjeruju on the Kwin, and progressively along the northern bank of the Kwin, as is above mentioned.

Under the division of the south and east coast are comprehended the states of—

Berou, consisting of Bulongán, Gunong tebur and Tánjong,
Kutei
Passir
Tánáh bumbu, to which belong :
Bángkáláán,
Tjingál
Menungul
Tjántong
Sámpánáhán,
Puntur láut,
Bátu litjin,
Kussán,
Págátán, and
Sámbánbán.
Mendávie,
Sámpit,
Pembuang and
Kutto-waringin,

The division of the south and east coast contains Government districts,

Tánáh Láut,
Dussun ulu and illier,
Bekompei
Pulo Peták (little Dáják)
Káhájáng (great ,,) and
Kápuás

And all the territories dependencies of these, also inhabited by different races of Dáyáks, of which a more detailed description will afterwards be given.

Among the States named above the following belong directly to the Netherlands.

Berou,
Tánáh bumbu.
Tánáh láut,
the Dussuns,
the great and little Dájaks and Kapuas
Mendáwei,
Sámpit,
Pembung and
Kutto-waringin

The remaining ones belong indirectly to the Netherlands rule.

Fourthly.—All the authorities and functionaries in Borneo are ordered, under their responsibility to be careful, that the Supreme Government's Rights of the State in the Lands and Districts, within the circumference herein stated, shall be honoured, and that the records, contracts and treaties, upon which these rights are based, attended to and followed.

The parts of Borneo on which Netherlands does not exercise any influence are:

a. The states of the Sultan of Bruni or Borneo-proper; extending from Tánjong Dátu on the west to the river Kemánis on the east, situated on the north west coast.

b. The State of the Sultan of the Sulu islands, having for boundaries on the west, the river Kemánis, the north and north east coasts as far as 3° N. L. where it is bounded by the river Atás, forming the extreme frontier towards the north with the state of Berow dependant on the Netherlands.

c. All the islands of the northern coasts of Borneo.

The first Dutchman who landed on Borneo was Olivier van Noort of Utrecht; he arrived on the 13th September 1598 with four vessels; on the 14th December 1600 he sent two Spanish vessels and

anchored on the 26th of the same month in the bay of Brunì or Borneo-proper; the inhabitants received him amicably, he traded there with some Chinese junks, and after having remained till the 5th January 1601 he again proceeded to sea.

In 1604 Admiral Wybrand van Warwyk, having under his orders five vessels, arrived on the southern coast; thence he went to the Kárimátá islands and sent a vessel to examine Succádáná; he would not enter into relations but for the value of a hundred piastres in diamonds; but the prince offered him the liberty of trade in his states.

From the 20th August 1603 the Sovereign of Bántám had ceded to van Warwyk some lands in the island of Java to form a factory; he nominated Francois Wittert one of the officers of his ships chief of it; in the instructions which were delivered to him, this officer received orders to visit the coasts of Borneo *where the lapis bezoar and diamonds are found in large quantities.* This chief on the 14th February 1606 sent an agent to Bánjermássing, who was assassinated there with all the crew of his vessel. Verschoor in January 1607 sent a commercial agent to Succádáná; the large quantity of diamonds which this agent, named Hans Roef, collected there, produced a resolution of the Council of Bántám dated 12th October 1608, which ordered the establishment of a factory on the coast of Borneo: Bloemmaertz was appointed chief, and power was given to him to conclude treaties with the princes of the states of Sámbás, Lándák, Bánjermássing and Borneo-proper.

A woman named Rátu Bunko governed the states of Sámbás at this time; the chief of the new Dutch factory presented himself to her, furnished with a letter from prince Maurice of the Low Countries, addressed to the sovereigns of Borneo, of which the object was the conclusion of treaties with these princes; but Rátu Bunko refused this, saying that *trade in her country was free to every one*, although at this time she was at war with some other states of Borneo as well as with the Sultan of Plembáng on Sumatra. The negaciator was more fortunate at Sámbás, where a treaty, concluded in 1609 with the Sultan Mohammed Djálá ud Din, authorized the Com-

pany to erect a factory, and accorded them the right of exclusive commerce in the states of Sámbás, as well as in those of Kámbáuwá and Lándák. In 1615 the agent of the Company, Henry Vaak was chief of the factory of Sámbás; but this establishment was suppressed in 1623. At the time of the arrival of the Dutch at Sámbás this state was subject to Malay pirates, and it was the principal resort for the exercise of this calling.

Borneo attracted attention from all quarters from its diamonds and bezoars to which latter wonderful medicinal virtues were attributed in Europe. The native princes were continually at war each endeavouring to secure the monopoly of diamonds of 5 carats and upwards which belonged to the rulers. The Sultan of Plembáng had often endeavoured to extend his authority to the western coasts of Borneo; the sultan of Bántám succeeded in doing so in 1770 by seizing the opportunity offered by the differences between Succádáná and Lándák. The Bántámese aided the latter, which in return ceded the diamond revenue of three districts to the Sultan of Bántám, who appropriated the districts themselves. In 1778 the Sultan of Bántám ceded to the Company all his possessions on the west coast of Borneo, and this formed the foundation of their power over this great portion of Borneo, for they had previously only occupied factories.

The Company sent a resident to Pontiánák where the Sultan Abdul Ráhmán was confirmed in his authority; on the 5th July 1779 a treaty was concluded by which he and his descendents received investiture by right of hereditary fief; but the Company reserved to itself the direct jurisdiction over the Javanese, Chinese, Malay and other inhabitants. It also caused a prudential clause to be inserted in this treaty limiting the admission of Chinese immigrants; but Abdulrahman, recognized as sovereign, did not very scrupulously excute this treaty. He employed the aid which had been granted him in extending his territory. In 1786 with the auxiliaries furnished by the Company he invaded the country of the Sultan of Motán and destroyed the city of Succádáná; at a later period he placed his grandson Sherif Kasim over the country of Mámpáuwá. He died in

1808 ; Kasim succeeded him ; he received indiscriminately all the Chinese who presented themselves, and their numbers became so great that he could no longer compel them to respect him. They became formidable to other princes also, who, on the restoration of the colonies to the Netherlands government in 1816, sent deputations to Batavia soliciting the establishment of old relations, as well as of civil functionaries and some troops to administer affairs and maintain order and quiet.

The expense of maintaining the establishments on the west coast was so great that in 1791 the agents at Succádáná, Mámpáuwá, Pontiánák and Lándák were recalled.

After the capture of Java the intermediate Anglo-Indian Government did not occupy itself with the interests of the princes any more than with those of the people. It appears that, for all manifestation of authority on this west coast, Governor Raffles contented himself with sending in 1813 some English agents to Pontiánák who remained there many months, probably in order to watch the conduct of the Sultan, during the time when an armed expedition was sent to Sámbás to avenge some piracies.

These countries consequently remained abandoned to the chiefs and subject to all the disorders inherent in power arbitrarily exercised by Malay princes. The incessant hostilities between Sámbás and Pontiánák, the continued state of trouble and agitation, but, above all, the turbulent conduct of the Chinese population, threatened these states with anarchy. The Chinese had been suffered to increase so greatly that the princes were now unable to offer any resistance to them. They therefore hailed with satisfaction the arrival in 1818 of the armed expedition sent to take possession of the old rights of the Netherlands upon these countries.

New contracts made with Sámbás, Mámpáuwá, Pontiánák and many other princes of limitropical states served to secure to us the exercise of the rights of sovereignty on this part of Borneo ; at the same time by this act Government saw itself placed in a very difficult position towards the immense Chinese population, little disposed to range themselves under its laws. In spite of the opposition from

this source the administration of justice and police and the collection of revenue were re-established; and government saw itself in a condition to exercise a more direct influence over the indigenous population.

But the princes very little caring for the well being of their subjects, and accustomed to dispose arbitrarily of their persons and their goods, found their hopes frustrated when, in place of an association of merchants, demanding nothing save an exclusive trade, and without any pretensions to authority, they found they had to do with a government liberal but just, which took to heart the interests of the people equally with those of the princes; a government willing the independence of justice, with a regular procedure, and an equitable and fixed collection of the public revenues; hence constant discussions and embarassments in the conduct of affairs which rendered it necessary to send extraordinary Commissioners.

Following the reports of these Commissioners of the government, it appears evident that, during the suppression of our establishments, the sovereigns of the west coast lived continually in disunion, particularly those of Sámbás and Pontiánák who carried on an incessant war.*

In 1822 George Müller was sent to the Sultans of Mátáng and Simpáng to renew the contracts with them. This was rendered more necessary by the active part which these princes were supposed to have taken in the piracies committed on the west coast, of which one of the most recent was the murder of the crew of the Dutch cutter l'Henriette. It was also known that English agents had presented themselves before these princes on the part of Governor Raffles, established at Bánkáhulu in Sumatra, after the restoration of our possessions in virtue of the treaty of 1814: a circumstance having more or less relation to the appearance in 1818 at Pontiánák of a vessel bearing the English flag, and the Captain of which was instructed to come to an understanding with the Sultan of Riou and establish himself on the Kárimátá islands; projects

* The original is here for a few pages so badly arranged and has so many repetitions that we have abridged it.—ED.

which were not carried into effect because at this time a flotilla of seven small Dutch vessels of war appeared before Pontiánák.*

We do not follow the diplomatic agent in his navigation of the rivers of Mendáuw, Mehâuw, Simpáng, Kátápán &c., to proceed to Simpáng and thence to Bengading, the respective residencies of the Pánembáhán of Simpáng and the Sultan of Mátán. New contracts were ratified on the 23rd November 1822 at Simpáng and on the 3rd December following at Mátán. On his return G. Muller took renewed possession of Succádáná. In 1824 the government of India took solemn possession of the Káminátá islands.

All the orders and strenuous efforts of the government for the complete establishment of order and the amelioration of the Dáyáks were opposed by the turbulent and intractable Chinese. The emigration of this people takes place chiefly from the southern provinces of China. Of the 8 or 9 thousands of souls who annually expatriate themselves, Java receives from 1800 to 2000; the remainder proceed to Borneo, Sumatra, Rhio, and Bánká.† If the Chinese laws were not severely opposed to the emigration of females, Malasia would very soon become a second Chinese empire.

These strangers have succeeded in reducing almost to nullity the power of the petty sovereigns with whom their predecessors, returned rich to their native country, formerly made contracts. The new aspirants to wealth finish by only paying taxes to the princes at their convenience; so that the latter have in some sort become dependents of these intriguers, who improve for their profit the most lucrative branches of commerce, and who by their industry appropriate more than two thirds of the revenues of the mines and the diamond washings. These pirates seeing their numbers and their power annually

* Although these attempts and many other acts of the old English Governor, Sir Thomas Stamford Raffles, with a view to maintain a footing in the seas of the Archipelago, had been disapproved of by England, *the occupation of Singapore remained not the less a fact accomplished.* The treaty of 17th March 1824 between England and the Netherlands has put an end, it is true, to these encroachments of British commerce, as well as to the attempts of its evangelical missionaries and philanthropic agents; but has not the Netherlands at this day serious motives for watching with solicitude the events which very recently have begun to happen in Borneo?

† See *ante* p. 286.—Ed.

increasing end by becoming formidable to these people, who little care to enjoy the riches which the soil produces, particularly if they are obliged to gather the fruits by an assiduous labour. The princes who only obtain an impost paid according to the convenience of these usurers, find no other resource, nor any other means of making themselves obeyed, than to solicit in their distress the assistance of the Netherlands government; which, although it has the means of effectually succouring and protecting them, does not always feel disposed to make its power respected when it is reduced to the necessity of using violent means.

The number of these Chinese adventurers in Borneo only amounts according to some documents of the Company, to 30,000; Crawfurd estimates them at 36,000, a figure which Mr. de Hogendrop considers to be much above the reality, but in which he is in error, for the approximative calculation made in 1836 carries the number of the Chinese dispersed in the states of the western coast to 130,000; the Englishman Earl gives for an approximative figure 150,000, of whom 90,000 inhabit the Chinese districts whilst 60,000 others are distributed in the Netherlands establishments. The Chinese governor of Montrado told Earl that the Chinese population under his orders amounted to 110,000; but he assures us that this estimate is much exaggerated.

By old ordinances still in force the Chinese are consideredas Netherland subjects. At Pontiánák and Sámbás, the chief places of the sub-residencies of the west coast, they are placed under chiefs appointed by Government; but more independent in the very extended districts of the interior, they form themselves into small democratical unions called *Kongsis*, under chiefs elected by the community: these societies are governed according to their own laws and usages, and they are bound by contracts with the Company's Government to pay an annual contingent, a duty which they know how to evade in every manner and which they term a voluntary gift.

The less considerable number of the Chinese on the south and east coasts causes the ordinances to be better observed there.

The considerable sacrifices made from 1816 to 1825 to subject

the western parts of Borneo to the immediate power of Government and to introduce a regular fiscal system have not led to a satisfactory result, chiefly owing to the opposition of the Chinese who obstinately refused to submit to our laws.

Since that period Governor General van den Bosch, guided by a system different from that of his predecessors, believed that it was the more prudent course of action to avoid mixing himself up in the commercial affairs of the Chinese, at least with respect to those of the interior. *The future will teach us whether this system of* laisser faire *will be salutary or pernicious in its consequences, for the maintenance of our political influence and our commercial relations in Borneo ?*

To prevent the landing of Chinese, of whom the greater number consist of adventurers and bad subjects who annually come to seek their fortune in the Archipelego, it will be necessary to apply to Borneo the laws and regulations followed in Java. There only a limited number of the newly arrived are permitted to land in the island and establish themselves; if such measures had not been taken to repress the too numerous immigration of those strangers, no doubt Java would have suffered the same fate as Formosa, and that it would now have been subject to Chinese. Under the protection of these ordinances we should see in time a remarkable diminution in the too great Chinese population of the western districts of Borneo; this result would be obtained by the return of those who had acquired riches to their native country, as well as by deaths in the existing population, and these two causes would suffice to decimate their numerical force. The Dáyáks whom we would seek to accustom by degrees and insensibly to the labours of the soil, would succeed to as great an extent as the Javanese; they would devote themselves to it on their interests being stimulated, and easy and certain markets being offered for their products. These peaceable Dáyáks would become habituated to labours which would enable them to satisfy a great number of their wants; they would become industrious and take a part in the mining of the precious metals; the direction of these labours being confided to Europeans, provided with all the

resources which our arts lend to industry,, it would become easy to obtain, by a more careful washing of these metals, by a better directed woking of the mines, a greater abundance of produce than the Chinese can get by means of the imperfect processes which they at present use.

(To be continued)

MALAY PANTUNS.

گريجا داتس بوكيت
بمبر لكس كرج سدكيت

تمفة برتاذم بلندا ماتي
سفاي سنغ دالم هاتي

چنچين بندو فرماة سيلن
جكلو زندو فندغله بولن

جاته برچيچير دفادغ تمو
دسانله تمفة كيت برتمو

فرڭي كلادغ فاڭي هاري
جك تيدق دفندغ فد سهاري

جك فانس برتودغ٢
روسقله هاتي تڭكي جنتوغ

سيره كونيغ فينغ كلت
فوته ورنا بركيلت٢

دماكن فاڭي٢ هاري
هيلغ دمان ايغ چاري

دري بندان بورغ سكاوان
سرة دفندغ برتمبه راون

برچمفور سيكور بورغ مرفاتي
هنچورلوله دداالم هاتي

فوهن جمبو دتغه فادغ
ورنا موك توان ايغ ترفندغ

سيكور اولر مليليتي
ايتله دبوت فڤيبور هاني

ليمو مانيس چندغ ككليغ
هيتم مانيس تندق منجليغ

سده ككليغ كجاوا فول
سده منجليغ ترتاوا فزل

مرفاتي تربغ سكاون
بوه هاني ماريله توان

هغڭف دفوكو بوغا چمفاك
ماري دودق سام٢ برسوك

توك٢ بركاوان٢
برسوك٢ دغن توان

دماكن دغن سايور كتي
جك ماتي بردوا سفتي

بوه كرنجي بروغكل٢
توان برجفجي بربتول٢

دغن سروغكل داتس فتي
سفاي سنغ دداالم هاتي

MISCELLANEOUS NOTICES, CONTRIBUTIONS AND CORRESPONDENCE.

Bangkok, Siam, March 1848.

TO THE EDITOR OF THE JOURNAL OF THE INDIAN ARGHIPELAGO, &c.,

Dear Sir,

My absence from this country for two and a half years is the only reason why your kindness in sending me several numbers of your Journal has not been previously acknowledged. I have little leisure to read or write on such topics as fill your work, yet they are matters of great interest to me—and, so far as they fall within the small circle of my information, and my leisure will permit, I desire both to read and write. But as I can write very little, I have thought I might be most serviceable in that little by correcting a few errors into which others have fallen, either from inadvertence or want of the means of accurate information.

That by this means I may draw upon myself the character of a *faultfinder* is probable, but if the public is benefitted thereby,—let that pass.

My first remark pertains to the boundaries of Cochin China on the west as given by *Dr Le Fevre* (ante Vol. I p. 52, 53, &c.,) Those various statements would seem to imply that a great part of ancient Kámbuja was swallowed up in Cochin China. It is true that a portion of it is in the possession of the Cochin Chinese, and they have till recently claimed most of it, but the claim has never been allowed by the Siamese. The city called by Dr L. *Colompé*, by the *Kámbujáns* and Siamese *Pen-nom-pen*, is said to be in Lower Cochin China, but even Dr. L. allows that the Kámbujáns have retaken it. The fact is the Kámbujáns are no longer a distinct and independent nation. the eastern part of their territory having been subjugated by the Cochin Chinese and the western fully taken possession of by the Siamese, and the latter, with the co-operation of the Kámbujáns under their rule, have retaken Pen-nom-pen, and held the occupancy

of it for several years. It is now governed by the Siamese commander in chief, *Phya Bodin.*

This place is situated on the great river called *Mè koñg* From this place north to the sources of the river, it is believed the Cochin Chinese have no possessions on the west side of the river. It is known that the river has numerous outlets to the sea; whether these are all in possession of the Cochin Chinese is doubtful. If they are, they do not embrace a very wide extent of country, and it would be sufficiently accurate for all general purposes to say that the *Mè kong* was the *western* boundary of Cochin China, and consequently the *eastern* boundary of Siam.

Another topic to which I would advert is the communication regarding the Siamese laws from Colonel Low.*

All praise is due to Colnoel Low for investigations into the language and literatnre of this country, while they were otherwise universally neglected by foreigners. Neither ought it to be forgotten that he pursued his researches under complicated disadvantages. The capital or central regions of the country, and the actual usages of the country generally, never fell under his personal observation. His pronunciation and usage must have been acquired among the southern provinces, where the dialect differs almost as much from that used at *Bangkok* as that of Yorkshire differs from the usage of the best educated Londoner. If, under these circumstances, he should have been sometimes misled and mislead others, it is in no way to be wondered at.

My first remarks relate to the *schedule* of *sounds* by which he would represent the Siamese pronunciation. He employs "*ú* short as in *but, rut.*" The Siamese of the capital recognize no such sound in their language. They have indeed one which resembles it when followed by *n* final, but under no other circumstances. It is exactly the sound observed in the last syllable of Anglic*an*, Germ*an* &c. The *á* to which he gives the sound of *a* in *all* has usually been employed by almost all Romanizers of eastern languages, during the last ten years to denote the sound he expresses by double *a*. The

* See Vol. I. p. 327

sound of *a* in *all* is precisely the same as that of *o* in *extol*, modify, &c., and *o* with some mark over it is generally used. He says *ù* is employed as the French *u* long and short. This would imply that the Siamese had such a sound in their language, but all the French writers regarding the language declare that the Siamese have no such sound. They have sounds which bear some slight resemblance to that of the French vowel, but it is far from being identical.

Passing these things, he remarks, p. 330 " The Siamese seem to have no distinct Báli code of civil or criminal Law," and after the intervention of a single sentence, he adds; " It may probably however be found, as I am inclined to believe it will be, that Báli Codes do exist in Siam."

First, it *seems* they have none; then, it may *probably* be found that they *have!* To cut off at least one horn of the dilemma, it may be definitely affirmed that they have such a Code, passing under the name of *Dhamma sátr*—a title of frequent occurrence in almost all those works of which the Colonel professes to give us an analysis.

On p. 331 three titles of codes are given on the authority of Dr. Leyden as employed by *La Loubere*. They are written *P,hra Tamra*, *P,hra Tam mon* and *P,hra Kam ma noot*. I have not either of the authors mentioned to refer to, but apprehend the two last to be sadly misspelled—*P,hra Tamrá* denotes a body of instructions or rules; these may relate either to morals, or medicine (which is the general application,) or even to the arts.

I cannot learn that the Siamese have any collection of laws called *Phra Tam mon*, but they have have one called *Phra Tam nun* and another *Phra Kam not Kot mai* which I suspect to be the works intended. But this last name is generally applied to all manner of treatises of a legal nature, much like our English words Institutes and Commentary. The other collection contains specific limitations, as of the time which a suit may be deferred without being nullified.

The expression *t,ho sok*, (p. 331 4, *l.* from bott.) is explained as though it denoted 2 years of a *century*,—which is not the case, but 2 years of a *cycle* of 12 years. (See p. 87 of the Grammatical Notices, which I send you herewith.)

The sentence commencing, " Bot P,hra Ayakán &c.," p. 332 is incorrectly translated. Notwithstanding some errors in transcription, I can make it out and the proper rendering is " This collection of the laws was given to me, a soldier of his Highness Duke *Indra wongsa*, when he came forth with an army to attack Mergui and Tennasserim in the year 1596."

Here I may remark that the Siamese have a civil and a sacred era, the latter being that of Budhism. The Budhist era, has now reached the 2399—and consequently differs from the Christian era 551 years. The civil era called *Chun la Sakkarát* has reached 1209, and therefore differs from our era 638 or 9 years. The Siamese year commences in April, hence in the same year there may be said to be a difference of a year. Thus the Siamese civil year now current is 1209, but after the middle of April, it will be 1210. These subtracted from 1848 will leave respectively 638 or 639. Hence the year 1596 in the preceeding date will be equal to A. D. 957-8 instead of 1055 as Col. Low has it.

On p. 333, about the middle, the title of one of the Siamese legal books is given as " Bai Set." It may be an error of the press or an incorrect reading of the manuscript. The proper title is Bet Set.

Reference is also made at the bottom of the same page to *Trai, Phúm*, or " the three worlds—Earth, Heaven, and *Nip,han*." Now *Niphan* is not one of the three worlds, nor a world at all. Its proper meaning is *destruction, termination, finale*, and it is employed to denote a *state of utter extinction*, as of a candle extinguished which can never be relighted. All being is considered as in a process of perpetual transmigration and change supposed always to be connected with suffering—the only full termination of which is *Niphan* the proper completment in three worlds is hell—of which according to Budhist ideas, a very copious description is given in *Trai Phum*.

P. 335 *Chau Toan* should be *Chau Suan*, the *u* and *a* in the latter word pronounced as the same letters in the Malay word *tuan*—when addressed by a servant to his master.

Some most singular and extravagant interpolations must have

crept into the Colonel's copy of *Trai Phum*, if the representation given of Siamese *traditions* is correct as given on p. 340.

The statement on p. 357 that at P,hoonga, "there was one priest for the care of every hundred souls" was amusing to us here at Bangkok, where from one fourth to one third of all the male Siamese are priests. But it is quite erroneous to represent them as having the "care of souls": They make no such pretensions.

Notwithstanding the various things thus freely remarked upon, and others which might be further noted, I am heartily glad that Colonel's Low Notices of Siamese Law have been published. Any thing which calls the public attention to a country too long neglected and overlooked will do good. Much has been said and written in regard to Burmah, but it is a smaller country and one of less power and interest than Siam. Why should the latter be less known or regarded?

Within a few days there has been an unusual occurence here Some Chinese, (the number cannot be definitely ascertained; rumour says, from 2000 to 3000) have banded together to resist the government near *Lakón Chai si*—about a day's journey west from Bangkok. They fired upon and killed *Phyá Mahá T'ep*, one of the high officers of the King. There are various and somewhat contradictory rumors in regard to the apprehension of the rebels. Quite a little army has been dispatched in pursuit of them: with this exception the country is generally quiet and prosperous.

Yours &c.,

J. Taylor Jones.

P. S. You will find some of the principles of Siamese pronunciation developed in a small pamphlet attached to the "Grammatical Notices."

TABLES EXHIBITING THE TRADE OF MANILA DURING THE YEAR 1847.*

TABLE I.

Exportations of the principal productions of the Philippines during the year 1847.

Articles.	Arrobas.	Pieces.	Taels	Numb.	Cases.
Hemp, ...	739. 159	..	..	..	..
Ajonjoli, ...	2. 362	..	..	..	..
Cotton	10. 854	..	..	..	..
Indigo, ...	30. 631	..	..	..	..
Rice, ...	485. 067	..	..	..	..
Sugar, ...	2.018. 194	..	..	..	..
Canes, ...	..	..	..	834. 600	..
Picih, ...	2. 136	..	..	..	..
Coffee	75. 221	..	..	..	..
Shrimps, ...	8. 528	..	..	..	..
Cassia, ...	. 599	..	..	..	..
Cowries, ...	3. 795	..	..	..	..
Hides, ...	43. 967	..	..	..	..
Guinars...	..	12. 815	..	..	..
Timber.	..	5. 234	..	..	..
Cloth, ...	..	65. 826	..	..	..
Dholl, ...	1. 376	..	..	..	..
Bullion Gold, ...	..	..	7. 667	..	..
Mats, ...	..	..	..	2. 667	..
Salt, ...	79. 866	..	..	..	..
Sapanwood, ...	380. 908	..	..	..	..
Hats, ...	..	..	..	52. 613	..
TOBACCO.					
Raw .. { To Foreign countries, .	47. 346	..	..	..	..
Raw .. { To the Peninsula, ...	44. 760	..	..	..	..
Manu- { To Foreign countries, .	11. 565	..	..	..	..
fact'd. { To the Peninsula, ...	. 489	..	..	..	..
Segars, ...	..	..	..	..	1. 933

* For these Tables we are indebted to the Hon'ble Colonel Butterworth, C. B.

TABLE II.

Statement of the Number, Tonnage, &c., of vessels which arrived at Manila during 1847.

NATIONS.	Arrivals from: Spain.	Foreign European Ports.	United States.	Batavia & dependencies.	Singapore.	Sooloo.	Molucco isl.	South Sea.	Australia.	Java.	China.	Total.	Tonnage.	Value of Importation.
Spanish ..	5	2	..	..	12	1	1	..	..	..	33	54	15,994	
American,	..	10	10	1	3	..	..	10	1	..	7	42	..	
Hanseatic,	..	..	..	..	1	..	..	..	..	..	2	3	..	
Belgium ..	..	1	..	..	..	..	..	1	..	..	..	2	..	
Chinese, ..	..	..	..	..	..	..	..	..	..	..	4	4	..	
Danish, ..	..	..	..	..	..	..	..	..	..	..	1	1	..	
French, ..	..	3	..	..	2	..	..	1	..	..	3	9	46,738	3,429,931, 16.
Dutch, ...	..	..	..	..	..	..	..	..	..	..	3	3	..	
British, ..	..	7	..	2	2	..	1	2	23	..	20	57	..	
Peruvian, ..	..	..	..	..	..	..	..	..	..	..	1	1	..	
Port'guese ..	..	..	..	..	..	..	..	..	..	1	2	3	..	
Prussian, ..	..	..	..	..	..	..	..	..	..	..	1	1	..	
Swedish, ..	..	..	..	..	..	..	..	..	..	..	1	1	..	
Grd. total,	5	23	10	3	20	1	2	14	24	1	78	181	62,732	

TABLE III.

Statement of the Number, Tonnage, &c., of vessels which sailed from Manila during 1847.

NATIONS.	Destination: Spain.	Foreign European Ports.	United States.	Havana.	California.	Batavia & dependencies.	Singapore.	Sooloo.	Molucca isl.	South Sea.	Australia.	China.	Total.	Tonnage.	Value of Exportation.
Spanish ..	7	..	..	5	..	..	10	1	3	1	..	29	56	16,239	
America ..	..	1	21	..	..	..	2	..	..	1	..	10	35	..	
Hanseatic ..	..	2	..	..	..	..	1	..	..	..	..	1	4	..	
Belgium ..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	
China	..	..	..	..	..	..	..	..	..	..	..	4	4	..	
Danish ..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	
French ..	..	8	..	..	..	..	..	..	..	..	..	1	9	42,228	3,126,141, 39
Dutch	..	..	..	..	..	3	..	..	..	..	..	1	4	..	
British ...	..	13	..	..	2	..	..	..	..	..	1	36	52	..	
Peruvian .	..	..	..	..	..	..	..	..	..	..	..	1	1	..	
Portug. ...	..	..	..	..	..	..	..	..	..	..	..	3	3	..	
Prussian .	..	1	..	..	..	..	..	..	..	..	..	..	1	..	
Grd. total,	7	27	22	5	2	3	13	1	3	3	36	50	172	58,467	

TABLE IV.

Statement of the value of importations into Manila during 1847 *from Foreign Ports and from deposit.*

	Dollars.	quart.	Cent.
National Commerce	143. 398.	6	42.
Foreign Commerce	3. 286. 532.	4	82.
From the deposit for consumption ..	359. 449.	6	12.
	3. 789. 381.	1	36.

Exportations.

National Commerce	2. 898. 960.	5	35.
Foreign Commerce	227. 180.	5	1.
	3. 126. 141.	2	36.

1. The precious metals in coins which have been imported during this year amount to $ 245,732.

2. The per centage of trade in Manila and dependencies by sea during 1847 has been as follows.

National, under Spanish flag	10, 28
do. ,, foreign ,, ...	29, 41
Foreign ,, Spanish ,, ...	48, 17
do. ,, foreign ,.	12, 14
	100,00

3. The Spanish mercantile shipping has enjoyed 58, 45 per cent of the total amount of freights paid to vessels in which the maritime trade has been carried on during 1847.

NEW PUBLICATIONS RECEIVED.

1st. *Journal of the Agricultural and Horticultural Society of India, Part II. of Vol. VI.*, (from the Editors.)

This number contains a valuable and interesting report by Dr. Jameson, Superintendent Botanical Gardens, N. W. Provinces, illustrated by numerous well executed plates, on the Tea plantations in Kumaon and Gurwahl, and on the method of treating the tea-plant, the manufacture of black and green teas &c. The other papers are:

"On the culture of American Cotton in India, and the proper time for sowing it in various localities. By Dr. R. Wight, Superintendent Government Cotton Farms, Coimbatore.

"Note on the culture of the Tea plant at Darjeeling. By Dr. A. Campbell, Superintendent of Darjeeling.

"On the Export of Wheat from India to England. By Professor Royle.

"Corresponding regarding the "Pooah" fibre of Nipal and Sikim, a species of Nettle, and the "Oadal," Sterculia villosa; with a report on their qualities.

"Note on various Indigo-giving Plants.

"Remarks on the propagation of Plants by Leaves. Communicated by H Rehling, Esq."

The Report of the Society for the year 1847 is of a highly satisfactory character. If a little of the stimulus which is supplied by a society possessed of so much vitality could be communicated to the Straits, we should not only see the culture of our numerous products scientifically investigated and improved, but abundant new vegetable materials brought into use. The jungles of the Peninsula must contain many things besides Gittá tábán adapted for the arts, but hitherto only partially known to the Malays, or undiscovered even by them. The Report notices the introduction of a valuable tanning substance from Chittagong—the pod of a tree called Teree.

"Mr Sconce was induced to send a quantity of these pods to the Society under the impression, from the similarity of the tree which produces them to the American Sumach, *(Cœsalpinia coriaria)* that they too would be found to afford a good tannin. The result has fully justified his anticipation. Mr. Teil (to whom the Society awarded its gold medal in 1846, in

appreciation of his services in having so satisfactorily tested the property of Indian-grown American Sumach) has reported most favorably of it; leather tanned by it being stated to possess "not only an equality in softness with that tanned by Dividivi, but surpassing it in color and appearance." Mr. Teil further gives it as his opinion,—the opinion of a practical tanner—that "it is consequently capable of being used far more extensively for tanning purposes, especially when a bright color is required, than the Dividivi:—and he adds—"if therefore it can be extensively grown, not only at Chittagong, but also in other parts of the country, at a moderate expense, I feel confident it would become an article of considerable demand in foreign markets, besides being extensively used in this country." The quantity placed at Mr. Teils disposal was too small to admit of his carrying out a series of comparative experiments with this product and other tanning substances, but this he will be able to effect in the early part of next year, when Mr. Sconce has promised to send a much larger supply of the pods. The tree in question, which is called *Teree* by the natives of Chittagong, appears to be unknown on this side of the Bay; but from the facility with which a number of individuals have been raised from seed at the Society's, nursery, there is little doubt it could be readily introduced all over Bengal, should subsequent enquiries prove that it is not indigenous.*

Agricultural department—The Vaonia of Darjeeling.

"In the circumstance above noted, we have another instance of imperfect knowledge of the vast vegetable resources of India, notwithstanding the various works and useful reports that have been published from time to time on the subject of its botany and agriculture. We have here brought to notice an indigenous substance, which apparently has never before attracted attention, but, which, in all probability, will be found an excellent and cheap substitute for articles hitherto procured from Europe and America. In a report like the present, it would be out of place to enter upon any lengthy dissertation on the many vegetable products of India which, at present scarcely known or neglected, might probably, by the bestowal of a little skill and capital, be added to our list of export articles; but it may not be

* Dr. McClelland, Officiating Superintendent H. C. Bot. Garden, Calcutta, to whom a flower and leaves of the *Teree* were lately referred, makes the following observation on it:—"The Chittagong plant is very interesting, as it would appear to be an undescribed species of *Cæsalpinia*, coming very close to *C. resupinata*, Roxb: but obviously differing from that species in having spinous stipels on the upper as well as lower side of the common petiole, and supinate, instead of resupinate flowers, the odd lobe of the calyx being posterior, and the stamens more woolly. It has never been introduced as far as I can learn."

amiss, before quitting the subject, to draw attention in a few lines to another tannin yielding substance which was last year brought to the notice of the Society by Dr. Irvine, in his interesting report "on the resources and products of Darjeeling." In that report Dr. Irvine alludes to the existence, in the forests of Darjeeling, of several species of oak affording *valonia* in large quantities, of a quality fully equal to that of Smyrna. At present the European tanners of this city obtain this valuable product from a foreign market, at no little cost, and without the certainty of its arrival in good condition; whereas, it appears, that the same article could be readiiy procured, for a comparatively trifling sum, at no greater distance from Calcutta than 400 miles!

"The Society reiterates the call made in the last report for further contributions towards this department of vegetable and mineral products. It would more particularly ask for specimens from all parts of the country of gums, gum-resins, vegetable oils, tanning and dyeing substances, fibrous materials, wild silks, and grains of sorts. Furnished with convenient apartments, it is now in a position to make a satisfactory arrangement of all such contributions, and will use every means to procure information as to the relatives values and properties of the different articles placed at its disposal.

"Another subject which, in its turn, has attracted attention, has reference to the *Kunchora* fibre of Rungpore. This superior material has been lately brought to the notice of the Society by Dr. Campbell of Darjeeling, and additional particulars given by Mr. Henley of Calcutta. As these details have been published in the Journal it is unnecessary to recapitulate them here. It is however worthy of remark, that further enquiries have tended considerably to strengthen an opinion that this plant, the *Urtica tenacissima* of Roxburgh,* is identical with that from which the superior fabric, known as the "grass-cloth" of China, is manufactured, and for which there is, at

The *Kunchoora* fibre of Rungpore, or *Rheea* of Assam.

* Dr. Roxburgh states, he was informed by a friend, a resident of Canton, that the grass-cloth of China is made from the same plant that yields the fibre which Marsden, in his history of Sumatra, calls Calooee *(urtica tenacissima)*. At Penang, he states, it is called *Ramy*.—See Roxburgh's observation on substitutes for hemp and flax.) Col. Low, in his work on Penang and Province Wellesley, alludes to the same plant, and by the same name *(Ramee)*, as yielding a sort of hemp; and observes, that it might be easily manufactured into the linen which in China is called grass-cloth. "The Chinese here," he adds, "calls the plant *Cho*, and alledge that it is the same as that which grows in China, where it is used for making the cloth just mentioned." Col. Burney, when Resident at Ava, sent a quantity of fibre of *Urtica tenacissima* to the Society; he states, that the Shans use it for every kind of cordage; by them it

present, a large demand for the English market. The probability of this identity rests principally on a communication from Major Hannay, who intimates that the *Rheea* (Kunchoora) of Upper Assam has been recognized by an intelligent Chinese gentleman, and corroborated by others of his countrymen, who were formerly employed at the Government tea manufactory, to be the *Bengchung Hapo*, or grass-cloth plant of China. Major Hannay has himself long been aware that the Shan hemp and the *Rheea* are the produce of the same plant. The question is alike interesting and important. Should the additional enquiries the Society is now instituting tend to remove all doubt of the identity of the Rungpore and Assam nettle with the China plant, the attention of those who are now engaged in the introduction into England of the material from which the grass-cloth is made might be advantageously turned to the Indian product, in order to ascertain if it can be grown and prepared at a less cost. If it, however, prove to be a different plant, the information thus brought to public notice may induce those interested in such matters to ascertain whether this fibre cannot be turned to a more profitable account than for fishing nets and towing lines, the only purposes for which, it would appear, it is at present employed."

is called *Pan*.—Transactions, vol. 3, page 11.) The late Mr. Landers, a traveller in the same country, refers also to this hemp, and adds, that though the Shans have various fibres they invariably prefer this description. —(Journal, vol. 2, page 253.) Major Jenkins has frequently sent specimens of it from Assam, and he also met with it in Cachar. That from the latter country he describes as "more like good hempen twine than that made from any plant in India, and from one small sample I saw well bleached, it would, I imagine, make a very neat canvas."—(Trans. vol. 2, page 171.) Major Macfarquhar raised it very readily at Tavoy, on the Tenasserim coast, from a few shoots sent to him in 1836 by Col. Burney from Ava. "It is cultivated," he remarks, "by the Shans, Siamese, and the Chinese; the two latter, with whom I have spoken on the subject, are loud in its praise for its fineness of texture and durability, both as cloth and cordage."—(Trans. vol. 5, page 19.) Mr. Fortune makes no mention of the grass-cloth in his recently published work, "Three years wanderings in China;" he merely observes, that "there is a species of *Urtica*, both wild and cultivated, which grows about 3 or 4 feet high, and produces a strong fibre in the bark, which is prepared by the natives, and sold for the purpose of making ropes and cables." It is not, however, improbable that the plant here refered to is *the* one, for it is well known that the plant which yields so fine a fibre as that from which grass-cloth is made, also affords a substance sufficiently strong for manufacturing into the largest cables. Moreover, this allusion to a fibre prepared from a species of the nettle tribe is interesting, inasmuch as it assists to strengthen the opinion—which has been doubted by more than one writer on the subject—that this grass-cloth fibre is produced from one of the *Urticeæ*.

2. *Dr. Hoevell's Tijdschrift voor Nederlandsh India* 2nd. No. New Series. (from Dr. Hoevell.) Besides a continuation from No I of the general view of the condition of Netherlands India during 1846 (which we find is likely to be too long for insertion in this Journal) and several miscellaneous articles, this number contains a paper on that interesting island Pulo Nias, which attracted so much of Sir Stamford Raffles' attention while he remained in Sumatra. We shall give a translation or abstract of this paper.

3. *Professor Jameson's Edinburgh New Philosophical Journal January to April* 1848, (from Professor Jameson) Among the original articles in this number are papers:

"On the Comparative Geography of the Arabian Frontier of Egypt, at the earliest Epochs of Egyptian history, and at the present time. By Miss Fanny Corbaux.

"The Bubis, or Edeeyah of Fernando Po. By Thomas R. Heyhood Thomsen, M. D.

"On the Distribution of the different species of Rocks in the Erratic Basin of the Rhone. By M. A. Guyot.

"On the Use of the Marine Hydrometer. By George Buchanan, Civil Engineer, F.R.S.E., President of the Royal Scottish Society of Arts.

"Topography of the Pennine Alps, and Primitive Site of the Principal Species of Rocks found in an erratic state in the Basin of the Rhone. By M. A. Guyot.

"Tabular View of an Arrangement of Minerals, founded on Physical and Chemical Characters. By Professor Jameson."

Professor Jameson has honoured this Journal by several very favourable and encouraging notices of it, and by extracting two articles from the first number, *Gutta Percha* by Dr. Oxley and *The Present Condition of the Indian Archipelago.*

4. *Journal Asiatique, Novembre-Decembre*, 1847, containing:

"La Rhétorique des nations musulmanes, d'après le Traité persan intitulé: *Haddyic ulbaldgat.* 5° et dernier extrait. (Garcin de Tassy)

"Mémoire sur la famille des Sadjides. (C. Defrémery.)—Suite et fin.

"Lettre à M. le docteur C. Vassallo. (F. Fresnel.)

"Mémoire sur l'écriture cunéiforme assyrienne (Botta.)—Suite.

" L'inscription phénicienne de Marseille. (S. Munk.)

" Critique littéraire.—Lettre à M. le Rédacteur du Journal asiatique. (Adrien de Longperier.)

" Nouvelles et mélanges.—Cri Bhagavat daçama skanda, traduit par M. Th. Pavie."

5. *The Chinese Repository*, January 1848. (From the Editor,) containing :

" The New Year ; a comparative English and Chinese Calendar ; list of foreign residents at the five ports ; government of Hongkong ; foreign legations ; consular establishments, &c.,

" Infanticide; translation of an essay warning people against the practice of drowning their female children : By Kwei Chungfu of Hûnân.

" An Essay on the proper rendering of the words Elohim Theos and into the Chinese Languages. By William J. Boone D. D. Missionary Bishop of the Protestant Episcopal Church of the United States to China.

" Revision of the Chinese version of the New Testament : proceeding of the delegates, from the General Committee of the Protestant missionaries assembled at Shângâi.

" Journal of Occurrences ; execution of murderers ; public meeting at Hongkong ; revenue and expenditure ; official appointments."

6. *The Calcutta Christian Observer*, March 1848. (From the Editor,) containing :

" To him, who is in search of Peace.

" Decision regarding the Parental Rights of Hindus and converts from Hinduism.

" Protentantism in Austria,

" Sketch of the religious state of Holland.

" Examination of Missionary Institutions,

" On uncovering the head in Public Worship."

7. *Report on the Collection of Australian vertebrata contained in the Museum of the Asiatic Society*, Calcutta by E. Blyth. (From the Author.) The indefatigable curator of the Asiatic Society's Museum accompanied this brochure by a letter in which he requests and offers co-operation in elucidating the Natural History of the Malayan countries. We shall be glad to send specimens whenever we may have an opportunity of collecting them, but the

most effectual way to accomplish Mr. Blyth's object will be to publish some extracts from his letter which we have no doubt will be responded to by some of our Natural History contributors and readers:

"This is one of several similar catalogues which I have ready or nearly ready for the Press; and in the mammalia and bird departments I have very extensive materials for a catalogue of our Malayan species, which I trust some day to treat of in a similar way.

"That you will render me all the aid in your power, consistent with the other and more important calls upon your time and attention, towards enabling me to collect materials for such series of comparisons, I feel assured; and therefore I write now less to ask your co-operation, than to open a correspondence on subjects of Natural History, in which we may perhaps be mutually useful to each other.

"Should you desire the names of species, and more especially of Vertebrata and Shells, you have my humble services at your command. I could either label collections sent to me for the purpose, and then to be returned, or series of duplicate specimens; or for the purpose of obtaining the names of species, the merest fragments of specimens of mammalia and birds would generally suffice to enable me to recognise them with facility.

"You have as I understand two able Conchologists at Singapore. Our co-Secretary, Mr. Laidlay, is also distinguished in this line: and we should be delighted to receive series of duplicate specimens, more especially of the land and fresh-water shells of the vicinity of the Straits, for which in return we could send those of India and more especially of Bengal.

"Of other desiderata generally, in the Zoological department, I shall not treat on the present occasion. I believe that our museum contains a nearly completed collection of the mammalia and birds of the Malayan peninsula; but is deficient in the reptiles, and still more so in the fishes. The only species I feel curious to ask about now, is the second species of COLLOCALIA, or diminutive *Swift* which builds the edible nests, mentioned in a late number of your Journal. I should like very much to receive specimens of this, and of its nest:

there is an Indian species of the same genus which is observed only in the mountainous parts, far inland, as at Darjeeling, Assam, and in the Nelgherries; and it remains to ascertain whether the nest of this species is analogues with those of its congeners which resort to caverns in the vicinity of the sea."

8. *Taman Pangatauan bagie kanak kanak*, June 1848. (From the Editor.) We rejoice to think, from the regularity with which this little periodical continues to appear, that Mr Keasberry's endeavours to communicate European knowledge to the rising generation of Malays in Singapore, through the medium of the vernacular, is succeeding.

THE

JOURNAL

OF THE

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

AN ESSAY ON CORAL REEFS AS THE CAUSE OF BLÁKÁN MÁTI FEVER AND OF THE FEVERS IN VARIOUS PARTS OF THE EAST.

By Robert Little, Esq. Surgeon,

Late Demonstrator of Anatomy at the Argyle Square School of Medicine. Edinburgh, &c.

PART. I.

ON THE MEDICAL TOPOGRAPHY OF SINGAPORE, PARTICULARLY ON ITS MARSHES AND MALARIA.*

The three settlements of Pinang and Province Wellesley to the north, Malacca in the centre, and Singapore to the south, are situated to the west of the Malay Peninsula, ranging between Latitude 1° 17' and 5° 25' north, and Longitude 100° 25' to 104° east.

Possessing such a limited range of latitude and longitude, parts of each scarcely differ in temperature, or other atmospherical phenomena, and one settlement as little differs from another.

All are possessed of a tropical sun that, by its light and heat, calls into existence organic life, and quickly hastens it through its various states, while the abundance of moisture either deposited by dew or gentle refreshing showers

"That more than weekly fall"

keeps the atmosphere cool, and prevents the parching effect of the

* In this paper some subjects deemed incomprehensible are attempted to be explained and data are furnished to enable the reader to form a comparison between this, and other places.

sun, giving us perpetual summer and continuous verdure: Pinang and Singapore being islands, and Malacca with an extensive sea frontage, always possess a gentle breeze blowing from one quarter or another, and being protected by Sumatra on the one hand, and the Malay Peninsula on the other, never experience furious gales or strong monsoons. But if more than ordinary heat has accumulated moisture and electricity, a squall generally sets in attended with a smart breeze of wind, and followed by a heavy shower of rain; very seldom is the wind unaccompanied by rain, and still more seldom is it accompanied by thunder and lightning. These squalls have but a short duration, seldom exceeding one or two hours. According to the monsoon which blows you will have them rising in that direction, as seen by the tables of observations taken at the Singapore observatory in January 1841. During the N.E. monsoon the squalls were four in number having their general direction northerly. In February the same direction was noticed, while there were six. In March there were four, but variable as to direction, for in that month the monsoon may be said to be changing. In April, two only were observed and they were from the west. In May, there were six in the direction of S.W. and N., and lastly in June, their direction was S.W. and their number four. Unfortunately this table stops at this month and gives but a faint idea of what more commonly occurs, for instead of 4 or 6 a month, it is much more common to have in certain months 15 to 20. During the last six weeks (26th April 1848), we have had 35 squalls; but in estimating the average number of squalls, this number is as disproportionally great, as the tables of the observatory are disproportionally under-rated. In the north-east monsoon a heavy dark cloud may be seen rising from the sea to the E. or N.E. this *nimbus* has generally an outer border of a lighter color, but the cloud itself is to the sight nearly black, and convex in its free border. The air that was heavy, hot, and close, now feels cool; a dark ripple is seen on the water, a rushing noise is heard, then is felt the breeze, quick in its progress, powerful in its effects, and short in its duration; to be followed by a heavy shower of rain. These squalls are very periodical in their appearance. If to-day one

is felt in the morning at 6, 9 to 10, it will be felt tomorrow an hour later or earlier; if in the evening the same will occur; but in the morning from 3 to 5 may be reckoned, as might tbe expected, the most general time for their appearance. The age of the moon has also some effect, as generally we have more squalls during the young moon than the full moon. A squall seldom falls where it is seen to rise, but describes a part of a circle.

We have two monsoons blowing here, the N.E. monsoon ought to blow according to general opinion during the months of October, November, December, January, February, March, and April,* and the S.W. monsoon, throughout the other months. But we generally find that the S.W. monsoon commences for a few hours in the day in March, blows more frequently in April, continuously in the other months until the end of October, when we have calms squalls, occasional puffs from the S.W. more frequently from the N.W. until having gone round the compass, it at last fixes itself in the North East, or more generally betwixt the N.E. and E. from which points it blows steadily till the middle of March, when we have again calms winds from various directions, squalls, but of less severity, until May, when the S. W. monsoon sets pretty steádily in. The N.E. monsoon compared with the S.W. blows much more steadily and with more force. This may be attributed to less high land intervening betwixt the China Sea and Singapore while the S.W. monsoon having to pass over Sumatra and the various islands to the south of Singapore is tempered in temperature and strength. The temperature of Singapore during the N. E. monsoon is lower by one to two degrees than in the S.W. monsoon. More rain falls for the same reason during the N. E. monsoon. For these reasons amongst others it is reckoned healthier.

But the currents of air which affect us most are the land and sea breezes. The first commences to blow about 8 P. M. and continues till 5 to 6 A. M. when the warm sea breeze takes its place, or no breeze at all. The greater the distance the resident is from the sea,

* November to March, both included, is the period generally given. See Horsburgh, *ante* p. 107. Ed.

the sooner does he feel the land breeze set in, and the nearer the jungle, and the less cultivation around the cooler is the land breeze. The approach of this land breeze is hailed with much pleasure by all in Singapore, but by none more than our delicate females, whose relaxed frames after a few years residence are obnoxious to the slightest changes. The land breeze sets in earlier in the N.E. monsoon than in the S. W. while the sea breeze in the S. W. monsoon continues longer. According to the natives, we have an *Angin-Jáwá*, or south wind, blowing from the direction of Java, which according to them is a most unhealthy wind. This idea is also maintained by nearly all the resident Europeans, and the longer the term of that residence has been the more fixed is that idea, from the effects being more severely felt. This wind is supposed to blow particularly in the S.W. monsoon ; *but especially in the month of September :* it is felt principally in the town of Singapore and extends as far as a mile inland. In my opinion there is no such wind peculiar to Singapore, but the hot and clammy perspirations, with the want of sleep with the weak and sickly ; and the langour and lassitude of the more healthy on rising in the morning, which forces out of them the remark " I declare I feel more tired and unrefreshed than when I went to bed," all these symptoms are merely the effects of a hot night, from the want of the land breeze, and not dependant on any particular wind or vein of air, or on any particular direction that the sea breeze blows from : in fact it is nothing but the want of the land breeze, and the substitution of the sea breeze, and if that land breeze did not blow there would be a continual hot atmosphere, and unrefreshing nights. As I have before mentioned, the land breeze blows more steadily and longer during the N. E. monsoon, for this reason no Jáwá wind is said to exist in this monsoon ; but let the wind chop round to the south as it did in the end of February and beginning of March 1848, and we have the same sensations as during the full reign of the *Angin Jáwá* or South wind, although it is not recognized as such from being out of season. This hot sea breeze is, as we are advancing into the interior and cutting down the jungle, advancing also, for those living in localities that were wont to be exempt from it

8 years ago, now feel it only a little less than the inhabitants of the town on the sea beach. This same hot wind has been felt by Mr. Thomson the government Surveyor in Pinang and Province Wellesley. One fact more may however be mentioned concerning it, that it does not exist where the jungle reaches the sea beach, and that when a cleared country becomes again covered with trees, this hot wind disappears, as the land breeze extends itself seaward.*

The following meteorological tables, except where otherwise noticed, are formed from observations taken at the Singapore Observatory. I am only sorry that I had not an opportunity of obtaining many necessary explanations from the talented observer, from his limited sojourn in this place; but it is to be hoped that these tables will be published in full at some future period not far distant, which reconciles me to giving the following necessary, but meagre extracts.

Table 1. On the Winds.

	Number of hours in which the wind is in each of the four quarters.				
Months.	N. W.	S. W.	N. E.	S. E.	Remarks.
January,.	1389	94	2097	126	These observations
Feb'ry...	645	105	2154	277	were taken during.
March,..	422	276	2145	537	
April,...	746	1213	1106	655	5 years.
May,.....	524	1070	356	1028	
June,....	343	1627	286	1549	
July,....	456	2142	185	925	
August,..	661	1737	210	1080	
Septr....	481	1332	287	704	
October,.	941	1048	726	347	4 years.
Novr....	1085	412	431	231	3 years.
Decr....	1207	237	1370	162	4 years.
	8,899	11,293	11,317	7,621	

* See a somewhat similar explanation of this Anein Java by the Editor p. 137-8.

[Our able contributor's explanation appears to be substantially the same as ours. The phenomenon resolves itself into the difference in temperature between the land and sea nocturnal atmospheres. The latter, through the prevalence of the southerly wind, encroaches on the limits of the former. Why the southerly wind should continue to blow over the land at night is a further question, which our contributor leaves unexplained as we did. Dur-

This table is a beautiful illustration of the little variation we find in the general laws of nature, though how often do we remark "how changeable is the weather! How varied from the past year, is the present"! and according to our feelings, or our interest do we accuse the monsoons of blowing longer in one way or another than their wont; but from these observations carried on during nearly 5 years, we find that the wind blows from the N. E. during 474 days 9 hours, and from the opposite direction S. W. during the contrary monsoon during 470 days, 13 hours. Another superficial deduction to be made is, that during the months of December, January, February, and March, the wind blows more continuously from the N. E. than any other direction; while during the months of June, July, August, and September, the wind is principally to the S.W. During the month of November, the general direction is N.W. while its antagonist from the S.E. blows principally in the month of June.

While the mean of these observations is so very uniform yet there are many individual yearly exceptions, for instance in January 1845 the wind only blew from the N. E. 277 hours instead of 419 which would have been the mean; but then it blew that same month 416 hours from the N.W. Again in February 1842 the wind blew from the N.E. direction 243 hours, while in 1843 it blew from the same 263 hours. The same applies to the S.W. monsoon as in June, 1842 it blew from the S.W. 200 hours, and in 1844, 396, in July 1841 it blew 583 hours from the S.W, but in 1844 the number of hours was reduced to 367, but during that year in both months just quoted the wind blew were frequently from the S.E. This leads to

ing the N.E. monsoon the land breeze and the monsoon coincide. During the S.W. monsoon they are opposed. The tendency of the denser land air to overflow into the rarer sea air, when counteracted by the force of the southerly wind, often fails to produce a land breeze. The lowness and narrowness of the extremity of the Peninsula also favour the southerly wind. If Singapore were mountainous the nocturnal land air would almost always flow beyond the shore into the strait. On the opposite side of the strait the direction of the N.E., which may be called the cold Continental monsoon, is opposed to that of the land breeze, and parallel to that of the sea breeze; on the other hand the S.W., which may be called the warm oceanic monsoon, is opposed to the sea and coincident with the land breeze. Hence, at night the *angin Jawa*, which is warm on the shore of Singapore, is probably cold on that of Battam.—ED.]

another deduction from these tables, that if the wind during the N. E. monsoon blows less frequently and steadily from the N.E. then it blows, more frequently and steadily from the N. W. The same with the S.W. monsoon, when the wind fails in that direction, it is to be found blowing from the S. E.

On examining that table another and important fact will be noticed that in April and October we have the winds from the north and south nearly balancing one another. In April we have winds blowing from the direction of N.W. and N.E. 1852 hours, and from the S.W. and S.E. 1868 hours. In October we have them blowing from the N.W. and N.E 1567 hours and from the S.W. and S.E. 1395 hours. These two months have more variable winds than any other of the 12 and affect the health of the community more.

The last remark I would make on this subject is that the wind in changing from the N.E. monsoon to the S.W. seems to do so by gradual changes from N. E. to N. N. E. north, then N.W. to west, and then to S.W. And in changing from the S.W. monsoon to the N.E. retraces its progress by retaining its westerly direction and not reaching the N.E. by north than S.E. and east; but adopting the same direction by which it reached the S.W. from N.E. viz., a westerly.

The next important point in a medical topographical account is the fall of rain and quantity of moisture in the atmosphere. It is generally stated in Meteorological works that at or near the equator the quantity of rain is much greater, but the number of rainy days much less than in more northern latitude. Humboldt gives 96, 80, 29 and 17 as the annual depths of rain at the respective latitudes of 0°, 19°, 45° and 60°. The Journal de Physique says, "From north latitude 12° to 43° the mean number of rainy days is 78½; from 43° to 46° the mean number is 103; from 46° to 50°, 134; and from 51° to 60° 161." According to Dr. Ward, the average number of rainy days for Pinang was 182, the least in one year 160, the greatest number in one year 209. Colonel Low informs us that the rain fell almost every day betwixt October 1789 and June 1790, betwixt May 1833 and April 1834, rain fell in 145 days on the

Penang plain, 166 on the Flag-staff hill, and 228 in Province Wellesley, the quantity at each station being

on Flag-staff hill.....	116 $\frac{6}{10}$	inches
Penang plain.....	65 $\frac{5}{10}$	,,
Province Wellesley..	79 $\frac{1}{10}$	,,*

Which observations differ from the generality of observations in England, where more rain falls on the plain than on the elevations in as circumscribed a locality as the Island of Pinang.†

These two authorities shew a great difference in the Hygrometrical state of the atmosphere of Pinang compared to the situations which have been the means of furnishing the observations of the Journal de Physique : it may therefore be remarked that if Pinang shews such a number of rainy days, Singapore will not shew less ; nay, it is thought by all who are well acquainted with the two settlements, that Singapore has more frequent showers, but perhaps, a less given quantity of rain, at all events there are not the number, nor lengthened draughts that Pinang is subject to; I am sorry I am unable to give any tables from my own observations or from that of others, shewing the number of rainy days during the period that the other meteorological tables were taken ; but I am told by a gentleman who keeps a private Journal that in the 5 last months of 1847 there were 130 rainy days. This amount of rainy weather is much beyond what is usual, 1847 having been almost unprecedented for its wetness. I am indebted to the Madras Quarterly Medical Journal for 1839 quoted by the India Journal, for the following extract by an anonymous contributor.

" In a place little more than 80 miles from the equator there is of course very little variety in the seasons. The greatest quantity of rain falls in December and January ; but refreshing showers are experienced throughout the year ; in 1820 rain fell in 229 days, in

* Dr. Wards contributions quoted by the Editor of the Journal of Indian Archipelago p. 108.

† The insulated mountain chain of Pinang, covered with dense forest for the most part, rises abruptly from the plain, and possesses all the cloud attracting and cloud producing properties which render the climate of mountains in general more rainy than that of the plains at their feet. Ed.

1821, on 203 days, in 1824, on 136 days, and in 1825, on 171 days; giving an average on 4 years of 185 rainy and 180 dry days." I am happy that I am able to give with accuracy the quantity of rain that fell at the Singapore Observatory in 4 years and 9 months embracing the years 1841, 1842, 1843, 1844, and part of 1845.

Fall of rain at the Singapore Observatory shewn by the number of inches.

Months.	1841.	1842.	1843.	1844.	1845.	Fall of rain each month for	
	Inches						
January,	3.750	22.585	18.070	10.219	5.750	60.374	
Feb'ry...	6.750	10.900	3.050	6.923	4.225	31.848	
March,..	5. 09	7.220	8.045	4.150	3.030	27.454	
April,...	3. 19	10.071	5 645	12.300	7.250	38.385	
May,....	6. 95	9.003	9.000	7.775	5.025	34.898	5 years.
June,....	7.490	6.320	2.270	6.025	5.375	27.480	
July,....	7.228	5. 98	8.500	5.890	3.395	30.411	
August, .	7.095	6. 25	5.545	5.750	6.750	31.165	
Septr....	4.220	4.250	4 055	5.075	10.250	27.850	
October,.	4.070	21. 05	12.145	10.200	..	47.420	4 years.
Novr....	12.225	9.420	9.560	6.060	..	37.265	4 years.
Decr....	6.175	4.350	6.415	8.750	..	25.690	4 years.
	73.126	116.247	92.300	19.817			

Taking the average of these 4 complete years we have 92. 697 as the annual fall of rain in Singapore. The greatest fall of rain in these 4 years was in the month of January to the amount of 22. 585, and the smallest in the month of April to the amount of 3. 19. 1842 must be considered as a very wet year, 116. 247 inches having fallen, while in the preceding year of 41 only 73. 126, is the amount. The months in which most rain fell were January and October, the next were April and November; while the month in which least rain fell was March. As already pointed out most rain falls in the N.E. monsoon, and the dry weather may be said to exist in the S. W. monsoon. No particular quarter of the wind seems to have much influence on the fall of rain; as these tables show we have the greatest fall when the N.E. is the general direction, nearly the same quantity when the S.W. is the quarter, and not less during the continuation of the wind from the N.W. The only inference that can be drawn is that when the wind is from the S.E. less rain falls.

Many tropical countries have an equal quantity of rain, and even more, annually falling; but owing to the fall being chiefly confined to one time of the year, an equal benefit with Singapore is not received, nay even it is the occasion of much disease when the rain is followed by great heats (Twining); the rain falling here in showers throughout the year and not confined to one season, gives a perpetual verdure to vegetation, cools the surface of the earth, and precipitates, as well as tends to diminish the generation of any atmospherical Malaria.

The jungle ever green and loaded with moisture, cools the currents of air that blow over it, giving us the pleasant and refreshing evening breeze, while the island of no great extent, elevated towards the centre and declining towards the coast, by its numerous small rivers, pours into the ocean the extra moisture which the vegetation and the thirsty soil fail to take up, by which all stagnation is prevented and marsh miasma is but little generated, except in a few spots. The state of dryness of the atmosphere, or that quantity of moisture which it can absorb, is very great in this island. I cannot from any observations of my own shew the absolute quantity of moisture contained in our atmosphere, but the familiar deliquescence of common salt, to such an extent that unless daily dried by heat it becomes fluid, the rusting of all iron instruments, the starting of wood made in Europe, and the separation of pieces merely glued, with the runing of ink on ordinary paper, are all too common instances of the great dampness of this climate. This solution of moisture in the atmosphere is a point of much importance in considering the subject of contagion, for wherever you have heat and consequent moisture, you have decomposition quickly accelerated. Malaria or miasm finds in moisture an excellent medium of transmission, and from the statistics of tropical countries it is well known that wherever there is much moisture there is a corresponding increase of diseases. "If we reckon by Fahrenheits' Divisions, air absolutely humid holds at the limit of congelation the hundred and sixtieth part of its weight of moisture; at 59° the eighttieth part; at that of 86° the fortieth part; at 140° the tenth part." (Encyclopædia Brit.)

The atmosphere of Singapore will therefore hold in solution double the quantity of moisture of that of Great Britain. While the temperature of the air rises in an arithmetical ratio, the power of absorbing and retaining moisture consequent on the rise of temperature increases in a geometrical ratio. We shall now examine the temperature as shewn by the Thermometer.

This instrument, so useful in shewing the actual rise and fall of the temperature, gives but a poor idea of our feelings, which in a latitude like this are susceptible of the slightest change, to such a degree, that, judging from what experience has taught in other and colder climes, we suppose that great changes have taken place, when in fact but little have; for instance, before a squall we feel the air hot and oppressive, the perspiration stands on the forehead in a sensible state, a relaxation of mind and body is experienced, the muscles lose their tone and the spirits their elasticity, but after the squall the air feels cool, nature seems to have thrown off a load, the spirits recover their elasticity, the muscles their tone, and man finds that he is himself again. Changes have taken place in the state of electricity, moisture and temperature; but with people in general too much importance is attributed to the last, and much surprised are they when told that the great difference in their feelings is caused by the slight fall of from 3 to 7 degrees of the thermometer. According to the calculation of Professor Meyer of Göttingen, the medium temperature of the air at sea in the latitude of the Equator is $84\frac{1}{3}^{\circ}$; at the latitude of 1° 17 north, which Singapore is, the increase of temperature is only a fractional part more. From actual observations let us see if this calculation corresponds with the truth. These observations taken at the Singapore Observatory during the years 1841-42-43-44-45, were conducted in a building situated at the distance of a mile from the centre of the town, having no house contiguous and built on the bank of a river subject to tidal influence. It was half a mile from the sea, from which it was separated by a mangrove swamp, houses and cocoanut trees. Towards the land it was clear of jungle and cultivation, the alluvial soil being sand with a clay bottom. The thermometer was placed in a circular box in a

centre room well ventilated, but not exposed to currents or the sun's radiation. This building was of brick 18 inches thick and surrounded by a wood verandah, the roof being composed of attaps and a ceiling of planks.

In estimating the correctness of the following observations the reader must bear in mind the conditions in which the thermometer was placed. It indeed most accurately shewed the temperature of the atmosphere of a room in that building, but not the atmosphere of that locality; for in the first place the building prevented all currents of air from affecting the temperature, which in this country are the means of reducing temperature. As well might we judge of the temperature of a country by observations taken in a deep dell surrounded by hills. In the second place the brick walls while they absorbed the heat by day radiated the same by night, therefore the thermometer would not rise to its proper altitude nor fall sufficiently at night. The mean of the observations taken at this Observatory will be correct; but the maxima and minima will be found to differ from those of all other observers. To estimate correctly the temperature of the atmosphere a circular building should be constructed with a roof of attap, and a ceiling of planks having no walls, and from the centre the thermometer ought to be hung.*

The limits of this paper will not permit me to give more than the aggregate observations, of which the following table is the mean of all the observations of each hour for every day of the month, obtained by adding up the observations of each hour for every day of the month and dividing by the number of days.

Table No. 2. Thermometer.

Month.		Month.		The mean temperature for the 5 years.
January, ...	79.55	July, ...	82.24	
February, ...	80.25	August, ...	81.80	
March, ...	81.22	September, ...	81.76	81° 247.
April, ...	81.47	October, ...	81.21	
May, ...	82 31	November, ...	80.63	
June	82.29	December, ...	80.24	

* The defects of the observatory for thermometrical registers are obvious, but perhaps not so great as our contributor considers. The atmosphere

From the inspection of this we may come to the following conclusions.

1st. That the mean temperature of this island is 2° 90 less than the temperature of other localities in a similar latitude according to Professor Meyer's calculations. 2nd. that the month of May possesses the highest temperature, and the month of January the lowest. 3rd. that the range betwixt the mean temperature of May and January, being the months in which the highest and lowest temperature occur, extends only over 2° 76.

On adding up the mean temperature of each month of each year observed, we have the mean temperature

of 1841	1842	1843	1844	& 1845
as 81. 28	81. 61	81. 09	80. 82	as 81. 66

from which we can draw this inference that for 5 years in succession the mean temperature did not vary one degree.

From other tables which I cannot give,* I find the greatest maximum temperature for the 5 years was 87° 5 and the greatest minimum 74° 7 the former occurred in June 1842, the latter in January 1843 by which we see that the greatest range was 9° 8 another conclusion to be drawn is that the mean temperature gradually increases from January to June, when it is at its acme; and than as gradually decreases from June to January.

is decidedly affected by the building, which is a Magnetic Observatory. The monthly tables which we have given for some time shew a considerable difference in the maxima and minima. The position of the thermometer is much better than that in the Observatory, but not free from objections. ED.

* These tables will be given at length hereafter accompanied by the Observer's notes. To correct one or two inaccuracies in the text we give the deductions from these tables in the Observer's own words. "From these data we can establish the following conclusions: that the range was generally from 6° to 7°,—that the greatest height to which the thermometer ever rose was 87° 5 in the month of June 1842, whilst the lowest to which it ever fell was 74° 7 in the month of January 1843,—that the coldest month in the year was January,—that the hottest was May, the mean of the former being 79° 55 and of the latter 81° 31,—whilst the mean temperature describes a curve gradually ascending from January to May, and gradually descending from May to January,—that the mean temperature for the five years was 81° 25, and the difference between the hottest and coldest months amounted to 2° 76,—*that the maximum temperature was at 3 P. M. and the minimum at 6 A. M.,—and that the mean of these two is nearly the mean temperature, so that an observer registering the thermometer daily at 6 A. M. and 3 P. M. would, by finding the mean, obtain the general mean temperature during the period of observation.*"—ED.

Table No 3 is formed from the observations of Captain Davis during 6 years. These observations were conducted in a brick house on the beach Campong-Glam, the thermometer being placed in a bow window on the ground floor; not having any further particulars, I cannot say in what other respects the manner of taking the observations may agree or differ with that of the observatory.

The average temperature of each month at 6 A. M. and 12 noon being added and divided by 2 gives the mean for the month,* and these monthly means being divided by 12 gives the mean temperature of the years

	1820	1821	1822	1823	1824	1825
as	79. 5	79. 4	80. 2	79. 8	81. 0	81. 4

Contrast that with the following one constructed from the observations taken at the Observatory during the same hours—viz. at 6 A. M. and noon.

Table No. 4,—*Thermometer.*

1841	1842	1843	1844	1845
82.	82. 08	81. 58	83. 7	84. 04

From the examination of these 2 tables I would make this inference, that in 20 years the temperature of this island has increased 2° 48. This is a most important fact; because if in every 20 years the temperature received such an increase, it would not require many generations to pass away before it became insupportable. But such will not take place as the cause is purely local and temporary, and in the course of time will be remedied. When Captain Davis made his observations, Singapore possessed very few houses, and these were on all sides surrounded by primitive jungle or equally dense mangrove swamps. From observation we know that a grass plot is much cooler than fresh ploughed land, as shewn in Edinburgh where a differential Thermometer indicated an increased temperature of 8° in a fresh ploughed land, while a grass-plot adjacent shewed no more than 3°, a hint that planters, more especially in Pinang, where droughts are frequent, ought not to overlook, when for appearance sake or other reasons they remove the fine grass a-

* See preceeding note.—ED.

round their nutmeg trees. A familiar illustration of the greater coolness of vegetation will nightly be seen in the greater quantity of dew deposited on the blades of grass than on a gravel walk, and all know that the shade of a tree is much cooler than the shade of a brick wall. The cutting of the jungle and clearing of the land round the town of Singapore has therefore most perceptibly increased its temperature, and fully accounts for the difference of 2° 48 between the mean of Captain Davis' observations and those taken 20 years later at the Singapore Observatory; and as I before mentioned has confined the spread of the cool land-wind, giving rise to moist hot nights, in which a wind called the *Angin Jáwá* is supposed to be blowing.

Table No. 5.

Months.	The mean of Solar Radiation	The mean of Terrestrial Radiation.	The mean of the hourly readings of the Barometer	Remarks.
January,...	115°.33	68°.20	29°.917	The Solar Radiation for January is the mean of 3 years, for the other months 4 years. The Terrestrial Rad. for January is the mean for 4 years, as well as the months of Sept. Oct., Nov. and Dec., the rest of the months are 5 years'— The observations on the Barometer are for 5 years, except during the months of Sept, Oct., Novr. and Decr., which are for 4 years.
February..	119. 62	63. 02	29. 914	
March,....	119. 87	64. 52	29. 884	
April,....	119. 90	67. 04	29. 886	
May,.....	122. 97	67. 90	29. 872	
June,.....	119. 97	66. 40	29. 858	
July,.....	121. 62	66. 52	29. 868	
August,...	123. 52	66. 42	29. 880	
September.	125. 02	66. 95	29. 886	
October,...	122 32	65. 37	29. 897	
Novr.....	125. 52	64. 95	29. 866	
Decr.....	122. 35	66.	29. 884	

All explanations or inferences to be drawn from Table No. 5, I beg to be excused from making, as the talented observer will himself I understand on some future opportunity do so; but one fact will strike the reader that the Barometer may be said to be at its mean height at 29° 886; and that it never varies more than one-twentieth of an inch, one month with another, shewing the little change there is in the elasticity of the Atmosphere.

This equality of temperature and slight variation in the elasticity

of the atmosphere, coupled with a temperature higher than is natural to Europeans, which enables the atmosphere to hold in solution much moisture, gives rise in the course of time to the only natural draw back, which this climate can be accused of, and that is, a universal relaxation of body and mind, especially of body, which creates a preternatural susceptibility to external impressions. In consequence of this preternatural susceptibility, a difference of 2 or 3 degrees in the Thermometer causes either feelings of much greater heat or cold than could be expected, and bitter are the complaints when a night is 2 degrees hotter than usual. As a natural result of this relaxation and increased susceptibility, all are liable to catarrhal affections, and the familiar complaint of cold in the head is much more common than in Great Britain, and is in 9 cases out of 10 produced by a slight check of the perspiration, from the draught of a Punka, or the natural currents of air. The medical man will at once be able to appreciate the many advantages which this favoured island possesses : but he will not or ought not to be ignorant of that most serious disadvantage which unfits it for patients affected with low nervous complaints, and diseases attended with relaxation. All patients affected with Chronic Diarrhœa, Chronic Dysentery, Gonorrhœa, Leucorrhœa, "et hoc genus omne" ought not to adopt this station as a desirable residence ; and residents who are so afflicted should if possible change the climate for a drier and a cooler one.

It has been the custom with the medical men of Calcutta to send to this station all patients in the last stage of consumption; many of them die 'ere they reach the settlement, and all who live to reach it, after rallying for a time, ultimately succumb to the complaint. I cannot say whether this dismissal of patients by the physician is intended to benefit the sufferer, or to save the reputation of the medical man ; but it has had the effect of destroying what little faith there was in the salubrity of Singapore as a climate adapted for Pthisical patients. And now it is believed by many that Singapore is as injurious for consumption patients, as it was supposed formerly to be beneficial. Before an opinion can be given whether this climate is adapted or not to European constitutions affected with

Pthisis, we must have subjects for trial in the first stage and not in the last.

In my opinion this climate is well suited to patients affected either with a predisposition to tubercular deposit, or where that has taken place to a slight extent. The moderate heat—the slight variations of temperature—the moisture of the atmosphere—all assist in relieving the lungs by throwing the eleminition of excretions on the liver and skin.

This opinion of mine I would consider of little value if it was not powerfully supported by facts. I have before me the reports for 4 years of the admissions and deaths of the patients in the European Hospital, the Convict Hospital, and the Pauper Hospital, with the *Insane* Asylum Singapore. In these four years the total number of cases of di-ease admitted into these Hospitals was 7586, and the total number of cases of diseases of the lungs 287, or 1 in 26. In the transactions of the Provincial Medical Association of England in an article on Medical Topography and Statistics, it is mentioned that the total number of diseases of the lungs in the two localities of Worcester and the Land's End was 3086; while the total number of cases of disease in the two districts was 18,082 giving 1 in 5.8 as the general ratio of prevalence, a favorable contrast for Singapore.

Table No. 6.

	Cases of Pthisis	Cases of Diseases of the Lungs.	Ratio of Pthisis.	Total cases of Diseases.	Ratio of Pthisis.
L'ds End & Worceste	713	3086	1 in 4.3	18,082	1 in 25.3
Worcester,.....	416	1616	1 in 3.9	9,255	1 in 22.2
Lands End,.....	297	1170	1 in 4.9	8,827	1 in 28.7
Plymouth,.....	176	..	..	5,648	1 in 32.0
Birmingham,.....	295	..	..	18,663	1 in 63.9
Hobart Town,.....	202	2502	1 in 12.3	30,008	1 in 148.5
Singapore,.....	49	287	1 in 5.8	7,586	1 in 154.4

From the foregoing table we see that while the ratio of cases of Pthisis to diseases of the lungs is not so favorable for Singapore as might be expected, yet the ratio of cases of Pthisis to other diseases is so; and that to such an extent that Van Dieman's land, suppos-

ed to be one of the most eligible situations for this class of diseases, must yield the palm to Singapore, in the proportion of 1 in 148, to 1 in 154. If the examination is confined to the Europeans, the total number of cases of disease is 662 and the total number of cases of Pthisis is 10, being 1 in 66.2 ; but it must be borne in mind that none but the most serious cases of disease present themselves for admission into the European Hospital, all cases of an ephemeral nature being treated on board of ship, or allowed to pass unheeded.

Table No. 7.

	Sir James Clark.	Dr. Forbes.			
	England and France.	Lands End.	London.	Birmingham.	Singapore.
Relative mortality from Pthisis, compared to that from other diseases	1 in 3.	1 in 4.3	1 in 4.2	1 in 5.3	1 in 11.9

But when Pthisis is fully established the victim has no escape. In the Worcester Dispensary 62 died out of 235 cases of Pthisis, or 1 in 3.8, in Birmingham the proportion was 1 in 1.38 ; In Singapore there were 49 cases of Pthisis and 40 deaths, being 1 death from Pthisis in $1\frac{22}{100}$ treated with that complaint.

In conclusion there cannot be a doubt that the climate of Singapore is one of the most eligible spots under the sun for persons predisposed to diseases of the lungs, but like all other climates, even the most favourable, it will not save those in the last stage of Pthisis from an untimely grave.

ON THE SUPERFICIES OF THE ISLAND.

The next point of consideration is the surface of the island. It is situated at the south of the Malay Peninsula, but rather more to the western than the eastern aspect, being received as it were into a recess of the Peninsula, whose eastern point comes further down, so protecting it partly from the N.E. monsoon. On all sides it is surrounded by land, its most open quarter being towards the south east, and to a less extent the west. In appearance on the map, it

somewhat resembles the Isle of Wight and in size does not differ much. Its length is 25½ miles, and breadth 14 miles, while it contains about 200,000 square acres, of which from 40 to 50,000 are under cultivation; the rest, perhaps 156,000, is still in a state of primitive jungle, formed of high trees, and dense impenetrable under brush-wood (J. T. Thomson). The highest point of the island is about the centre, though nearer the south than the north, and the west than the east. This elevation is about 500 feet high, composed of granite, while its name, *Bukit Tima*, denotes the existence of an important metal Tin, which was once obtained from it. The rest of the island is composed of ridges and sloping vallies. The ridges running somewhat parallel to the length of the island, which is east and west. The vallies are of limited extent except one or two, in one of which Singapore town is situated, and which must contain 20,000 square acres under cultivation, or cleared of jungle. The island is nearly surrounded by coral formation, but except at a few isolated spots as at *Túnjong Págár*, *Pássir Pánjáng*, and in the Old Straits, the coral is not exposed at low water, and even these spots are but of a limited extent. Sand and mud, and here and there rocks of Sand-stone and Iron-clay-stone is the general nature of the anchoring ground close in shore, as in Singapore Harbour. The rivers are not large but very numerous, so that whatever rain falls, is soon carried to the sea. Many indentations are seen in coasting the island, which might be mistaken for the mouths of large rivers, but they are merely creeks, or arms of the sea, with perhaps a rivulet opening into the inland aspect. Extensive marshes for the size of the island exist, but they are all with a few exceptions open to the sea and subjected to tidal influence. The only plutonic rock in the island is granite and its modifications; to it and Sand-stone, do we owe the mineral part of our soil, the rest is derived from animals and vegetables. The upper soil of the island throughout, is of a light description, principally sandy on the tops of the hills, and red soil at their base; or light red soil as the covering with clay as the base. Some hills contain a little more alumina and Iron in their surface soil forming laterite, which on the hills varies in depth from 2 to 50

feet with a base of clay which in the plains is met with from 10 to 50 feet below the surface, or broken Sand-stone. The vallies are of course the richest in good soil from containing what is washed down from the hills, as well as that immense quantity of half decomposed vegetable matter, which successive generations of vegetable life furnish. From the general appearance of the valley of Singapore, from coral having been found in making excavations, with shells and that kind of black mud, a compound of decayed animal and vegetable matter, we would infer that this has been reclaimed from the sea by a process of elevation, which may to this day be going on, and that this elevation cannot be very ancient may be inferred from the fact of Mr. Thomson having found a piece of wood bored through at one end with the remains of a twisted rope, 40 feet below the surface, and $\frac{1}{4}$ a mile inland to high water mark (*ante*, p. 136). At the western entry of this valley the town of Singapore is built, facing the sea to the south, and having a range of hills about 100 feet high to landward. Through the centre of the town runs the Singapore river, the largest river on the southern aspect of the island. On the East forming the boundary in that quarter is the Kalang river. Betwixt these rivers there is a third of some importance in Medical Police from having been converted into a canal in a part of its course; it drains a large extent of ground, it is called the Rochor Canal and carries off the superabundance of water that would otherwise stagnate on a valley of some size through which the Bukit Timá road runs. The river of Singapore that divides the town in two, has its channel near the mouth of great breadth, perhaps 150 yards, and at high water permits boats of 30 to 60 tons to enter, but at low water the insignificance of the stream is visible; from its mouth about $\frac{1}{4}$ of a mile inland it receives an anastamosing branch, which in the shape of a canal joins it again higher up, having 5 to 6 feet of water at full tide, but dry at low water. A little above the bridge at Campong Malacca, the river divides into numerous branches, one of which proceeds as far as the Seapoy lines, others join to form islands covered with mangroves and dry at low water, until tracing its progress inland through many turns and windings for about 2 to 3 miles, it is

lost from its insignificance in the district of Tánglin. Into this river the drains of the most populous part of the town are supposed to empty themselves. On the banks of this river and its divisions, hundreds of houses, inhabited by both poor and comparatively wealthy natives, are built. These houses are of wood, or attaps, erected on posts and covered with attaps, having betwixt the inhabitants and the swamp only one open flooring of *Nibong*. The elevation of these houses is just sufficient to place them above high water mark; their aggregation forming certain Campongs or villages, called Bukit Passu and Campong Malacca, and on the Rochor canal Campong Bugis, having collectively a population of perhaps 2 to 3,000, constantly living in swamps. These mangrove swamps on which the houses are built, and other swamps within $\frac{1}{4}$ of a mile of Singapore, occupy about 1,000 acres; but previous to the extension of the town and the draining that has been practised within a few years, the ground occupied by swamps under tidal influence, must have been 3 or 4 times that extent. When the tide is at its ebb these marshes are dry, and disclose a bottom of very fine black slimy mud some feet in thickness, saline in its properties, and giving forth Carbonic Acid, Carburetted and Sulphuretted Hydrogen to such an extent, that those unaccustomed to live in the vicinity can scarcely breathe from the intolerable stench of the last. This is more particularly applicable to the canal running through Canal street and close to the Jail, and the canal that skirts the North Bridge Road. The houses at Campong Bugis, Rochor, and along the canal of that name, so ironically stated as pleasantly situated on its banks, are all subject to the same atmosphere, which is so contaminated with Sulphuretted Hydrogen that white lead paint used to the walls of the buildings is almost immediately blackened. To the east of the town and valley of Singapore, in the districts of Síglâp and Táná Mérá, and in other parts of the island, we had and still have swamps of a different kind, not subject to tidal influence. These swamps or marshy vallies are surrounded by moderate elevations on all sides, except one which generally faces the sea. They were formerly used as Paddy Grounds, the high jungle having been cut down, but as that

agricultural produce has for some time ceased to be cultivated these vallies are now occupied with rank vegetation, such as species of Graminaceæ, Cyperaceæ and other plants that court a boggy soil. The principal part of the rain that falls sinks into the ground and lodges there, for the under soil is of a clayey consistence; the rest goes to the nourishment of these plants, which spring up to the height of 6 feet, vigorous, healthy, and strong, till their time of decay comes, when their decomposed state gives stimulus, and strength, and nourishment, to those plants that take their place. The sun shines down with its full brilliancy and effect, having no high trees to ward it off, raising into existence many forms of organic life with an alarming celerity. The hills around protect the vallies from breezes or gales, giving the atmosphere a heavy, warm, and sickly feeling, while the absence of currents of air and the presence of much moisture, retain undiluted the pernicious malaria. A few Bugis and Malays are seen located on the sides of the hills, but the visible living in the vallies are confined to frogs and snakes, some, as the Ular Sawa or Python, reaching the enormous length of 30 feet, the snipe in its season is to be met with, but our wild animals as Deer, Pigs, and Tigers, limit their peregrinations to its borders. These fresh water vallies may be called the vallies of death, and furnish incontestable proofs of the malarious influence of decomposing vegetable matter.

In the high jungles we have vegetation undergoing somewhat the same decomposition that occurs in the vallies, but not to such an extent, owing to the height of the trees, and the denseness of the under brushwood preventing the action of the sun. A tree that falls, or leaves that cover the soil, in a dry situation merely undergo a slow process of combustion, by which the Carbon unites with oxygen very slowly, and elicits carbonic acid. In marshes again where there is free moisture, and access to air and sunshine, instead of a mere decay of vegetable matter, there is a decomposition, the carbon not only unites with oxygen to form carbonic acid, but the water contained in the plant is decomposed,—its oxygen uniting in a certain proportion to form carbonic acid, while its hydrogen unites with

another proportion of carbon to form carburetted hydrogen. In a wet marsh this decomposition goes on with redoubled vigour compared with a dry one, from the water furnishing abundance of oxygen and hydrogen to form carbonic acid and carburetted hydrogen.

One advantage of draining consists in carrying off this superabundant water and reducing the carbon to combine with the water solely contained in the vegetable, by which the formation of carburetted hydrogen is almost entirely prevented. Liebig states, "when wood putrefies in marshes, carbon and oxygen are separated from its elements in the form of carbonic acid, and hydrogen in the form of carburetted hydrogen. But when wood decays or putrifies in the air, its hydrogen does not combine with carbon, but with oxygen for which it has a much greater affinity at common temperatures."

In a marsh we may have the two processes going on at the same time, towards the surface we may have the decomposition of vegetable matter and the formation of carburetted hydrogen, while below we may have the slow combination of the carbon with oxygen forming carbonic acid, an act of slow combustion by which the wood is charred: how often planters here must have noticed that charring of wood!

Yet another formation is seen in our rivers and its tributary canals when under tidal influence, when carbon unites with oxygen and hydrogen to form carbonic acid, and carburetted hydrogen, another proportion of hydrogen unites with the sulphur of the sulphates of the salt water to form sulphuretted hydrogen. Here there is an addition to the product of fresh water marshes in the existence of sulphuretted hydrogen, and in no small quantity. In some fresh water marshes sulphuretted hydrogen may be generated in small quantities, when we have a particular class of plants, as the cruciferæ; but if these plants are buried deep, so that decomposition goes on but slowly, there we have sulphurets formed, in the shape of pyrites or crystallized sulphuret of iron. Regarding the addition of sulphuretted hydrogen to the other products found in fresh water swamps, let the reader pay particular attention, as it will go far to elucidate the nature of miasm.

PART II.

In 1819 this island was made an English settlement, and it then contained about 2 to 300 Malays; from that number the population has principally, if not almost entirely increased by immigration to 57,422, according to the census of 1845, composed of the following nations as seen in this table.

Nations.	Males.	Females.	Total.
Europeans,	204	132	336
Indo Britains,	158	122	280
Armenians,	38	27	65
Malays,	6,217	4,818	10,035
Chinese,	28,765	3,367	32,132
Bengalese,	350	200	550
Klings,	3,948	700	4,648
Javanese,	210	50	260
Bugis,	1,340	631	1,971
Portuguese,	214	168	382
Arabs,	210	50	260
Caffres,	26	33	59
Parsees,	14	none	14
Boyanese,	223	9	232
			52,347
Convicts,	..	..	1,500
Military,	..	..	487
Patients,	..	..	70
Hospital European,	..	..	17
Floating Population,	..	..	3,000
			57,421

This table at the present time is far from accurate, as the population may be computed at 70,000, and moreover it is almost impossible in the present state of acquaintance which subsists betwixt natives and Europeans, to elicit the truth regarding their number of adult females and children, but it is sufficiently minute to suit all medical purposes. In addition to the natives enumerated there are many others, As for instance we have Siamese and Cochin Chinese classed under the head of Chinese, Americans with Europeans, Jews with Armenians, Bengalese include all the natives of India, except Klings and Parsees, Malays the various surrounding countries. By

Portugese are understood the descendants of Portuguese, that in the marriages and inter-marriages with natives for 300 years have nearly lost all national features. In a medical point of view I would look upon all the variety of races that are settled in this island as capable of being divided into 3 great classes. The *first class* may be particularised as possessing a full habit of body, well fed and clothed, and whose occupations do not expose them to local influences creative of disease, but which is the reverse with their mode of living; this class includes Europeans, Indo-Britains, Armenians and Parsees, and the principal men in the second class. The *second class* may be said to be an industrious, hard working race, whose occupations expose them to whatever local influence may exist to create disease, whose habit of body is gross, full and flabby, whose food is bulky, not heat creating, and but little azotised; who are sufficiently clothed, but poorly housed, and of whom the majority earn but little more than necessary for their support, and moreover are addicted to the immoderate use of Opium, by which not only is their life rendered miserable, but its duration much curtailed. This class includes the Chinese, Siamese and Cochin Chinese. The *third class* may be described as a spare yet muscular race of small size and not disposed to form fat, in temper and passions quick and excitable when roused, but lazy and indolent generally; sufficiently clothed but poorly housed and pursuing occupations which expose them to all the local influences creative of disease; in diet sparing and that diet of a bulky nature, not heat creating nor exciting, and but little azotised; whose wages are sufficient to clothe them and feed them. This class includes Malays, Bengalese, Klings, Javanese, Bugis, Portuguese descendants, Arabs, Caffres, Boyangs, in fact all natives of India and the Eastern Archipelago, not included in the first and second classes. In this last class, I would include the convicts, who are natives of India except a very few local Chinese and a few from Hongkong.

In Singapore with the exception children and bedridden adults, it would be impossible to suffer from starvation; privations are the lot of all, but it must be said for this our tropical region that all kind Providence seems to have opened her stores most lavishly for the use of

man; he needs neither toil nor spin, and yet like the lilies of the field-he can be fed and clothed. Every cleared spot that is allowed to run into jungle, furnishes leaves of various kinds that can be used in curries or in stews. The common *Ubi kayu* gives a delicious arrow root and this plant is found as a weed, and used as a fence; in all parts the clady (arum esculentum) that springs up indigenous to our marshes and ditches, though possessed of a poisonous fluid in its leaves and epidermis of the root, yet furnishes in the latter when boiled a wholesome food for man, and fattening nourishment for pigs in its leaves. The sea and rivers teem with fish, and the beaches with molluscs and edible sea weeds. If any part of a ditch is dug, in 3 or 6 months it will be filled with fish, and daily from it you will see superannuated women and young children drawing out small yet tasty fish to season their dry rice or insipid clady.

Before a disease can be produced it is necessary to have first an exciting cause, such as exposure, miasm or contagion, and second a body in an apt or predisposed state to receive the impression of the exciting cause, and this aptness may be produced, among other predisposing causes, by bad and low living, or too high living. But of the two specified predisposing causes it has been found that poor living induces a condition of body much more favourable to receive the poison of Malaria and contagion than the opposite state, nay, to such an extent does it do so, as in appearance to swamp the exciting causes and give rise to the idea that poverty and wretchedness alone will induce endemic fever. I cannot think so, or else we would often in cases of shipwreck, and long voyages, have those exposed to such a fate, when extreme want has been for a length of time pressing on them, and death in the shape of starvation staring them in the face. I say in such cases if poverty alone could create fever, then we ought to have it developed to a frightful extent; but such is not the case. No, instead of going the full length of Dr. Alison's views, I would stop short with this conviction, that poverty and wretchedness predispose the body to receive the impression of the smallest taint of contagion and miasm.

In the first class of my division of the population nine-tenths of

the diseases that afflict them are the result of their imprudence, or errors in living; highly seasoned dishes, meats of various kinds, but little vegetables, and with the exception of the morning, a total abstinence from water, and a strict adherence to Wine, Beer, and Spirits, and that too in a latitude so obnoxious to inflammatory complaints, engender 70 per cent of the diseases that afflict us here; indeed it has long been a matter of wonder to me how my fellow countrymen retain their health in spite of all their efforts to destroy it. It speaks volumes for the climate. During 8 years practice in this island I have had more deaths among European patients from inflammation of the brain and its membranes than from all the other diseases that flesh is heir to. The next class of fatal diseases are inflammation of the liver and intestines, the latter of much the more frequent occurrence. Of Febrile diseases, Intermittent fever has been of late years more prevalent, since the custom has been commenced of living in the country. Remittent fever as indiginous to the island, has only attacked to my knowledge 4 Europeans. The 1st was a Constable, who, some years ago, while in the jungle making a census of the people, was attacked and died. I attended him and found his case in all particulars identical with the Java or Batavia fever, or Dummám Cápiálla of the Malays. The 2d. case was Mr. C——— who, after his return from Europe, made a very fatiguing excursion into the jungle, was attacked with the same fever, and though every exertion to save him was used by Dr Oxley, yet he succumbed to the disease. Having been called in to this case I found it exactly the same with the preceding, but with more liver derangement. The 3d. case was another Constable, attended by Dr. Traill, who received the miasmatic poison in the jungle and died. The 4th. and only case of recovery was Mr. D. who, living at the very base of a marsh once drained and rendered healthy, but afterwards the drain having been allowed to become obstructed, the marsh was brought back to its former state, was attacked with symptoms of remittent fever, with great cerebral excitement. I had him removed from his house and brought into town, and by vigorous treatment and a powerful constitution, he recovered, the only one of the four that did.

On the authority of Drs. Martin, and Oxley, and on my own, I venture to say that for the last 16 years, these have been the only cases of Remittent fever attacking European residents, produced by *local* causes.

By the kindness of Dr. Oxley I have been furnished with 4 annual reports of the diseases and deaths of the patients in the European Hospital, the Convict Hospital, and the Pauper Hospital with the Insane Asylum; but as it would be impossible to do justice to these reports and confine this paper to a reasonable length, I cannot give more than the report on the diseases produced by local influence.

I will now shew the reader what has been published concerning Singapore, and that I may not extend this paper to too great length I will be as brief as possible.

"The site of the town is remarkable for its salubrity, and the fevers and dyssentries of ordinary tropical countries are of very rare occurence. I have no recollection indeed of any European having fallen a victim to the climate in the long period of 9 years, since the formation of the settlement. This may appear at first view the more remarkable, since a considerable portion of the site of the town, and much of the neighbourhood is a low and even noisome marsh.—*(Crawfurd's Embassy.)*

"It has been a matter of astonishment that the settlement, surrounded as Singapore is by marshes, should from the time of its formation, never have suffered from the extensive exhalations which must of necessity arise from them. The causes which operate in the production of Malaria are at first view all combined; the fact however, that malignant Remittent fever is unknown at Singapore would render an absolute assertion to this effect nugatory. That a very large quantity of decayed vegetable matter is imbedded in the fresh and salt water swamps is undeniable, and from their number, extent, and general aspect, it becomes an interesting question, to what circumstance are we indebted for the total absence of the more formidable varieties of fever, and the acknowledged salubrity of the cli-

Return shewing the specific diseases by which the admissions into Hospitals and deaths has been occasioned in the Settlement of Singapore.

	From 1st Jan. to 31st Dec. 1843.						From 1st Jan. to 31st Dec. 1844.						From 1st Jan. to 31st Dec. 1845.						From 1st Jan. to 31st. Dec. 1846.					
	European Hospital.		Convict Hospl.		Pauper Hos. & In. As.		European Hospital.		Convict Hospl.		Pauper Hos. & In. As.		European Hospital.		Jail and Convict Hospl.		Pauper Hos. & In. As.		European Hospital.		Jail and Convict Hospl.		Pauper Hos. & In. As.	
Diseases.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
Febris Intermittens,..	12	..	265	2	3	..	1	..	204	..	3	..	20	..	287	3	4	..	22	..	144	6	3	1
Do. Remittens,..	8	3	4	2	..	..	1	..	3	..	..	..	10	2	1	..	46	15	3	1	..	..	1	..
Do. Continua, ...	..	..	..	..	..	..	1	..	..	..	..	..	4	2	..	..	..	..	2	..	..	..	..	..
Do. Ephemera,..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	1	..	139	..	..	..
Total,..	20	3	269	4	3	..	3	..	207	..	3	..	38	4	288	3	50	15	28	1	283	6	4	1

mate? The almost unvaried alternations of land and sea breezes concur in a tendency to disperse any venomous exhalations that emanate from the decomposing matter; and in contemplating this anomaly of marshy ground, luxuriant vegetation, and high temperature, with an absolute immunity from various febrile disease, the admission is almost forced upon us, that this agency is not wholly inoperative, yet it never could be conceded that this of itself is sufficient to account for the absence of Malaria; stagnation of the atmosphere certainly takes place, and time is doubtless allowed for the concentration of any malignant product of the soil if they really existed, whilst it is evident that ventilation in other situations where various effluvia are known to be generated, affords little security against their efforts. That the settlers at Singapore have never experienced the baneful influence of febrific miasma, is to be attributed, it would seem to its absolute non-existance, and not to the salutary operation of any agents rendering a Pestilential atmosphere innoccious."—(Indian Journal April 1st. 1839.)

In Dr. McCulloch's work on Malaria in reference to Singapore he says, "but there is one mystery for which I can conjecture no solution, while it rests on great authorities, and while every imaginable circumstance is present that ought to render the land in question one of the most pestiferous spots under the sun. It is a collection of jungles, woods, marshes, rivers, and sea swamps; and it is a flat and under a tropical sun, and it is the land of monsoons; and yet is a land where fever is unknown; and this land is our new settlement of Singapore. I dare not attempt to contradict such testimony, and must try to believe what I cannot understand, but others may for aught I know be inclined to suppose that some favouritism not perhaps inexplicable has dictated this report."

From these quotations, the reader will without doubt have embraced the idea that Singapore is a spot free from febrile influences, though in examining the preceding table of Febrile Diseases, that belief may be shaken on a superficial view: but to look deeper and properly understand that table, in the first place it is necessary to explain that the inmates of the European Hospital are derived

from the shipping, and with few exceptions, not from the resident Europeans, 2nd. that the cases of Intermittent fever have been mostly contracted originally in other countries, few or no cases having been primarily produced in Singapore, 3rd that not one of the cases of intermittent fever has been so virulent as to cause death, 4th. that that all the cases of remittent fever have been imported, the subjects of the disease having been suffering under the malady on entering the harbour; or, as I have seen in the favorable monsoon from Java, having received the malarious influence there, that has not been perfected until 8 to 10 days have elapsed, and while they were in Singapore harbour. Referring to the reports of the convict hospital, there is to appearance an alarming amount of intermittent cases, but when examined they will be found to be of such a mild type, that in 900 cases there were only 11 deaths. In fact on a more careful classification of diseases, one half in 1846 were placed under the head ephemeral, and this might with equal truth have been adopted in the previous years. Moreover these convicts who were attacked with intermittent fever, were living and working, in the majority of cases, in the country amongst fresh water swamps, at Siglap for instance. If intermittent fever was indiginous to Singapore no class of men would have suffered more from it than the convicts; but we find that in 4 years there were only 8 cases, of which 2 died, and I have Dr. Oxley's authority to state that these cases of remittent fever were not contracted in Singapore, but on an island contiguous and used as a flag staff station. The unusual No. of 46 cases of remittent fever in the Pauper hospital for 1845 is accounted for by the shipwreck of 3 vessels that year having native crews, who being brought to Singapore were found to have contracted remittent fever and were admitted into the hospital. From the testimony of others and from my own observations I may state as the fact, that the town and immediate suburbs of Singapore are free from all malarious influence of that description which generates fever of a malignant type; but this will not apply to the country, for wherever a large band of Convicts have been stationed near to a fresh water swamp, or have been road making through such a swamp, these convicts have almost to a man been

attacked with intermittent fever, for instance when stationed at the Galang in a swamp called Páyá Báser, and at Biddu previous to its being drained. Until within the last 4 years no Europeans lived in the country contiguous to fresh water swamps; but about that time, not knowing that fever was to be met with in any part of the island, I built a Bungalow on a hill situated 6 miles from town, one mile from the sea, with a swamp to the East and S.E., and the primitive jungle of high trees inland. I did not reside there one month, sleeping only 2 nights weekly, until I was attacked with intermittent fever of so severe a type as to resist all treatment for months. On a subsequent occasion my brother by sleeping in the same house was attacked with intermittent fever, but of a milder type. On a hill at the base of the marsh, a mile distant from my Bungalow and close to the sea beach, about the same time was built another Bungalow; the proprietors and others only resided there on the Saturdays and Sundays, but all, to the number of four, who did so were attacked with intermittent fever. The inhabitants chiefly Malays, of the neighbouring village of Sigláp in that district, were continually subject to intermittent fever, a few cases passing into a remittent type. At the base of the beautiful hills which surround this swamp, are groves of fruit trees, and remnants of houses, whose inhabitants were obliged to leave on account of fever and tigers; the air seemed to be purer, the temperature was lower, the water was better, and the soil was of a sandy nature, with a clayey subsoil, in all these respects superior to what we meet with in Singapore. What then was the cause of this malarious influence? The swamp, I fancied, and accordingly applied to the Government to have it drained. A drain $1\frac{1}{2}$ miles in length, 5 feet in breadth, and 4 feet in depth was made, which had the effect of carrying off all the superfluous moisture, and now, instead of a swamp producing nothing but species of Cyparecæ and Graminaceæ reaching the height of 5 and 6 feet, and, of such a boggy nature that in a few steps you sunk seve-feet, there is a dry cultivated plain, well drained, growing vegetables, and cocoanut trees, and firm under foot; but above all, instead of a swamp of decomposing vegetable matter, the generator of malaria,

there is now nothing but a decay of vegetable matter, eminently useful in the support of the trees cultivated in it, and from which decay no miasmatic or malarious principle now proceeds. Six months after draining that marsh, intermittent fever disappeared!! So that, during subsequent years those who have resided in the two Bungalows already mentioned, and who have not resided for a day or two but for months, have not been attacked, and the villagers of Sigláp have been as exempt, as formerly they were prone to attacks of fever.

Within the last 12 months the drain got obstructed, and the ground in some parts returned to its former state, the consequence of which was, that some of those who lived in the village of Sigláp, and Mr. D. who resided in the Bungalow close to the beach, were again attacked with remittent fever. My coolies were attacked with intermittent fever, and in short, the locality was returning to its former unhealthy condition when I again requested the Government's assistance in clearing out the drain, which was willingly granted, and fever again disappeared. The same occurred at Bidu, 3 miles from Sigláp, where there is a large swamp, formerly like the Sigláp one an extensive Paddy field. The convicts while located there were incessently attacked with fever, and the villagers also; this swamp has now been drained to form cocoanut plantations, and fever has much abated, yea almost disappeared. If our attention was directed to other parts of the island, we would witness similar results. From these facts I will deduce the following conclusions.

First. That Singapore town although surrounded by salt water swamps subject to tidal influence, is exempt from endemic fevers.

Second. That where Europeans or natives are located in the island of Singapore contiguous to a fresh water swamps, they are particularly obnoxious to fever, principally of an intermittent type.

Third. That on draining a fresh water swamp the fever will disappear, but on the return of such a swamp to its original state by the obstruction of the drainage, the fever will also return. Other conclusions not less important may also be drawn, as the following. 1st. that within 6 miles from Singapore town fever can be generated

while the town itself is, as stated by Dr. McCulloch "a land where fevers are unknown." The deductions I would make from that are, 1st. temperature in this instance cannot be a cause of fever, as the difference of temperature about 1° lower, is in favor of the fever generating district. 2d. The state of moisture—fall of rain, electricity, winds, and currents of air, all these can have no effect in making the one place more healthy than the other, as from the proximity, the same meteorological changes must be felt in both places at the same time, indeed the palm of superiority in all these respects would be carried off by the fever generating locality, which has free ventilation, and an atmosphere not polluted by the respiration of thousands of human beings, nor the effluvia from the filth of as many thousands of natives, who know not the charms of cleanliness. There is only one inference to be made, and that is, that although both the town and the country are possessed of swamps, those near town are under tidal influence and those in the country not, and that as we find the town to be exempt from fever, and the country not, we must attribute to the swamps in the country the fever, and to the state of these swamps, viz., their freshness and their not being subject to tidal influence, the generation of malaria, as in these respects only, do they differ from the swamps in town.

Having I think clearly shewn that a locality contiguous to fresh water swamps is obnoxious to fever, and that it is not so when contiguous to swamps subject to tidal influence, the conclusion to be drawn is that either *some malarious influence is generated in fresh water swamps which is not in those subject to tidal influence, or, if generated, that there is some counteracting agent which renders the malaria innocuous.*

In a former part of this Paper I have stated the gaseous products of decomposing vegetable matter to be carbonic acid and carburetted hydrogen, and where sulphurets are present sulphuretted hydrogen. Where animal matter exists with vegetable there is in addition ammonia. These are the known and acknowledged gaseous products of marshes and are by some considered as the Malaria. "Carbonic acid and sulphuretted hydrogen which are frequently evol-

ved from the earth in cellars, mines, wells, sewers and other places, are amongst the most venomous miasms" (Liebig); and the supposed existence of sulphuretted hydrogen is, according to Daniel, the cause of the Sierra Leon fever. If these gases in such small quantities as they exist in marshes can occasion fever, they will, when in a more concentrated state, produce fever of a more malignant type, or even in the same state of dilution will, in other places and under other circumstances, produce the same effects, if any malarious principle is inherent in them; for chemistry acknowledges no difference in the constitution and properties of these gases when prepared in nature's vast laboratory, or in a chemist's small one. To prevent the prolixity of referring to numerous authorities on the properties of these gases, I will confine myself to Dr. Christison's work on poisons, the highest standard authority on the subject.

Carbonic Acid. When a man attempts to inhale pure carbonic acid gas, the nostrils and throat are irritated so strongly that the glottis closes, and inspiration becomes impossible. Hence when a person is immersed in the gas nearly or perfectly pure, as in a beer vat or an old well, he dies at once of suffocation (fourth ed. p. 815.) M. Devergie has been led to the opinion that air which contains 5 per cent of Carbonic Acid is amply enough impregnated to occasion death (p. 821). The incipient symptoms of poisoning by this gas, when it was estimated to be 2 per cent as a constituent of the atmosphere, are given by Mr. Coathupe, he having closed every aperture in a room of the capacity of 80 cubic yards, kindled the stove and watched the results. In 4 hours he had slight giddiness, in 5½ hours intense giddiness the desire to vomit without the power, excessive prostration, and incapability of muscular effort, a frequent full trembling pulse, a sense of distention of the cerebral arteries, agonising headache, but no sense of suffocation. Such are the symptoms of a narcotic poison in a diluted though still dangerous quantity. The unfortunate prisoners in the Black Hole of Calcutta suffered from the narcotic effects of this gas, produced by the respiration of 146 persons confined in a room not 20 feet square; but I cannot coincide with the Editor of the Indian Register, that this re-

cord of suffering and symptoms, "affords proof invaluable, that fever, gangrene and plague, may all result from the same polluted air." According to the tables of Mr. Quetelet, Charcoal Burners are within the list of trades where the mortality is sometimes above and sometimes below the average rate of mortality. Miners, Brewers, and Lime Burners all breathe an atmosphere much more impregnated with Carbonic Acid Gas then what is to be found in marshes, and yet we do not hear of these trades suffering from fever more than other trades.

Carburetted Hydrogen. M. Majendie ascribes to the agency of this gas the specific power of marsh miasmata, and quotes a case where several persons being asleep the chamber was filled with this gas and they were seized with typhus of a very severe form. "But how does this accord with the known effects of Carburetted Hydrogen? When an atmosphere is strongly impregnated with it symptoms of narcotic poisoning are produced in those that breathe it; M. Devergie mentions that one person was comatose, and occasionally convulsed with froth issuing from the mouth, occasional vomiting, sterterous breathing, and dilated pupils and in 9 hours he breathed his last. But Uysten found it inert when injected into the veins, and what is more to the point, Colliers breathe the air of coal mines without apparent injury when strongly impregnated with it." "The mixed gases of coal gas and oil appear likewise to be inert when considerably diluted; for gas men breathe with impunity an atmosphere considerably loaded with them," "and in the course of some researches on the illuminating power and best mode of burning these gases, Dr. Turner and myself daily for two months breathed air strongly impregnated with them, but never remarked any unpleasant effect whatever."—(Christison.)

"Sulpheretted Hydrogen Gas. This is probably the most deleterious of all the Gases."—(Christison.) According to Thenard and Dupuytren air containing only an 800th of it will kill small birds in a few seconds, a 290th will kill a dog, Champier found a 250th kill a horse. Such are the certain effects of the gas when breathed in a concentrated state. "Dr. Turner and I found that Hydro Sulphuric

Acid is very injurious to vegetables," appearing " to exhaust the vitality ofplants, and to cause in them a state analogous to narcotic poisoning in animals."—(Christison.) M. Halle says, the symptoms, in cases where the vapours are breathed in a state of concentration are sudden weakness and all the signs of ordinary asphyxia. When the noxious emanations are less concentrated, several affections have been noticed, which may be reduced to 2 varieties, the one consisting of pure coma, the other of coma and tetanic convulsions." In none of the " French investigations on this singular subject has any allusion been made to the question, whether the health sustains any injury from long continued exposure to the Gas in very minute proportion. It is *probably* injurious however. At one time while in the practice of not using any precautions against inhaling the Gas in chemical reseaches, I used to remark that daily exposure to it in a minute quantity caused in a few weeks an extraordinary lassitude, langour of the pulse, and defective appetite. Mr. Taylor says, that the workmen in the Thames Tunnel became affected with giddiness, sickness, general debility and emaciation, then with a low fever attended with delirium, and in the course of a few months several died. No cause could be discovered except the frequent escape of Sulphuretted Hydrogen from the roof."—(Christison.)

From these extracts we see that this Gas does possess very injurious effects when breathed in a concentrated form, we and cannot but suppose, that even in a much diluted form it must be injurious. Indeed to such an extent was it supposed to be so that the fever which attacked those who navigated the Niger was attributed by Professor Daniell to the existence of this Gas in the water of the river, and the specimens of the water when brought to England freely evolved the gas ; but the Editor of the Brit : and For : Med : Rev : No. xxxi p. 263, says, " the section on the causes of fever is valuable, but throws no new light on the subject except to disperse the theory promulgated some time before the sailing of the expedition from England, that the existence of free Sulpheretted Hydrogen Gas in the waters of the Niger might account for the fever. Dr. McWilliam shews in the most satisfactory manner that no such gas is found in the Niger,

and that what was detached in the specimens sent to England, originated in the bottles themselves from decomposition of their contents."

Professor Gardiner of the Hampden Sidney College, endeavours to shew that Sulphuretted hydrogen is the active agent in the production of fever of malarious districts, both maritime and inland. His arguments are principally founded on Professor Daniell's theory, which has been found to be incorrect, and on suspending polished silver to the action of what gas might be, in 3 small rivers, in marshes, small springs and the air over marshes and springs; in all these experiments the silver was stained, in marshes in 24 hours, in rivers a month, and in the air sometimes longer. The effect produced on the silver was so slight and embraced such a length of time to produce the effect, that these experiments of Professor Gardiner cannot be considered of any weight. In opposition to his theory I would cite this, that in a part of Paris where the contents of the necessaries of that vast city are collected for making poudrette, sulphuretted hydrogen is disengaged in large quantities, to the olfactory annoyance of the neighbourhood, but, according to the French commissioners who examined the spot, not to the visible detriment of the health of the neighbourhood or workmen in the buildings. Sometime ago I made the following experiments. I saturated white blotting paper in a solution of carbonate of lead, and then dried it; this I cut into pieces and suspended in various parts of the town of Singapore, near the Jail, in the river, and in the canal in new bridge road, and in the course of a few hours all were visibly blackened; that in the canal near the Jail being the first to be so, then the canal on new bridge road, the last to be so being that which was suspended in the river, but all shewing that sulphuretted hydrogen existed to a great extent.

About the same time I suspended in the air in several situations over the marsh at Siglap, where I have mentioned fever once abounded, several pieces of paper saturated with lead, and in 48 hours exposure no visible effect was produced, shewing that no sulphuretted hydrogen existed. This plan of testing sulphuretted

hydrogen is a much more delicate one than Professor Gardiner's.

In the spots where sulphuretted hydrogen abounds according to my observations no fever exists. To arrive at this conclusion I have made repeated and repeated enquiries on that point, amongst a class of natives who live entirely in small boats in the river, and canals just alluded to, sleeping there without fail, wherever their avocations may lead them to during the day. These natives are Chinese and Malays. The latter are regularly domesticated in their boats, their wives seldom venture on shore, except to see some festivals, or purchase a little finery, and when they do so they seem really to be out of their element. The children are brought into the world, brought up, and leave it, in their boats, and to complete their isolation although they are Malays yet their *patois* is so peculiar as only to be understood by themselves. These natives are without an exception free from fever. The inhabitants of the houses that skirt the canals and the river are also exempt from fever, though I cannot say positively that occasionally it may not have attacked some. But the strongest proof of all, is that there is a canal which skirts the east side of the Jail within a very few yards of the building and which canal at all times emits sulphuretted hydrogen gas, but twice a day at low water to such an extent as to be almost unbearable by the inmates from the stench, and which gas blackens in one hour paper saturated with carbonate of lead, suspended a few feet above the water, yet for all that not one inmate of the Jail from July 1844 to March 1848, died of fever, as may be seen by the following table.

A list of the Prisoners, including Criminals and Debtors, who died in H. M's. Jail, (from natrual causes,) since 1st January, 1844.

Total number of Prisoners confined in the Jail during that period, 1447.

No.	Names.	Chinese.	Date of Committal.	Died.	Remarks.
1	Wee Han,.. ..	Chinese.	Dec. 4, 1843.	Jan. 23, 1844.	An old opium smoker, died apparently of dropsy for want of opium.
2	Tan Boon Seng,	do.	Oct. 14, „	July 24. „	Do. Do. Do.
3	Inchi Whay, ..	Malay.	June 2, 1844.	Aug. 9, „	An old man about 60. died of dysentery.
* 4	Syed Ali Omar,	do.	„ 14, „	„ 30, „	A very stout young man, died suddenly of worms.
* 5	Silappet,.....	do.	Mar.27, „	Sep. 5, „	Age about 30, died suddenly of disease of the liver.
6	Chowah Chong,	Chinese.	June 5, „	„ 29, „	A middle aged man. opium smoker, natural death.
7	Tan Leat, ...	do.	„ 6, „	„ 14, „	Do. Do. Do.
8	Tea Assam, ..	do.	Oct. 14, 1843.	Oct. 13, „	Do. Do. Do.
9	Arakapen,.. ..	Hindoo.	June 19, 1844.	„ 25, „	An old man of ill-health when committed, died of dysentery.
10	Limah Hat, .. .	Chinese.	Oct. 14, 1843.	Dec. 21, „	A middle aged man, opium smoker, dropsical.
11	Kne Seo Lea,..	do.	„ „ „	Jan. 9, 1845.	An aged man natural death
12	Low Beow,....	do.	July 23, 1844.	Mar. 2, „	A middle aged man, opium smoker, dropsical.
13	In Chow Kow,.	do.	Aug. 2, „	„ 15, „	Do. Do. Do.
14	Bookoo Pow,..	do.	Oct. 10, „	„ 25, „	Do. Do. Do.
15	Devarta,.....	Malay.	Sep. 10, 1846.	Nov.11, 1846.	Do. died of dysentery.
16	Mahomed,....	do.	Dec. 19, „	Jan. 24, 1847.	Do. natural death.
17	Tungah Sea, ..	Chinese.	May 6, 1847.	Aug.29, „	Do. died of dysentery brought on for want of opium.
18	Maat,.....	Malay.	Apr.29, „	July 13, „	A convict from Pinang, old and sickly when he arrived.

* Coroner's inquests were held on the bodies of Nos. 4 and 5, Dr. Ratton examined them and gave evidence as above. The great mortality in 1844 is attributed to the crowded state of the Jail. The Recorder having gone to Calcutta some of the Prisoners awaited their trial 10 months and upwards.—*H. M's. Jail, March 24th., 1848.*

In conclusion, I must say that in my opinion no inference can be better proved than this, that, *the presence of sulphuretted hydrogen does not create fever, nor is it the active principle of malaria.*

The proofs being so strong against any of the known gaseous products being the active principle of malaria, I think that unless we remain satisfied with a name we must examine further. When animals and vegetables terminate their temporary existence, they only cease to exist as individuals, being resolved into more simple forms, until we approach a certain animalcular state of life, beyond which our observation terminates, and perhaps the vitality of the substance likewise ; the ultimate products of animal and vegetable decay are carbonic acid, water, and ammonia, which contain the elements necessary for the support of animals, and vegetables, "all the innumerable products of vitality resume, after death, the original form from which they sprung. Thus the destruction of one existing generation becomes the means for the production of a new one, and death becomes the source of life" (Liebig). All the observations hitherto made upon contagious matters prove, that they also are substances in a state of decomposition. When vessels filled with ice are placed in air impregnated with gaseous contagious matter, their outer surfaces become covered with water containing a certain quantity of this matter in solution. This water soon becomes turbid, and in common language putrifies, or, to describe the change more correctly the process of decomposition of the dissolved contagious matter is completed in the water," (Liebig). This is the state in advance of the ultimate products, for on adding a solution of corrosive submliate to the mixture condensed by the ice in the manner just described, a white precipitate is produced just as a solution of ammonia does.

This is the gaseous product which is the active principle of *malaria*, and which, when evolved from a diseased body and capable of reproduction, is called *contagion*, and from ammonia being elicited from this contagious matter, as well as being the last product of animal life, I would infer that this gaseous body is the last of animal or vegetable products, possessed of vitality and in the state of germ.

That these germs should ellude our imperfect observation is not to be wondered at when we consider that the dust which floats about contains particles which swell when moistened, and are seen by the microscope to be the monads of infusoria according to Schultze; while Ehrenberg has found that the smallest monad of $\frac{1}{24,000}$ of an inch in diameter has a complex stomach and organs of motion in the form of cilia. What must be the size of the germs of such monads? But though so minute their power of reproduction is wonderful. A single wheel animalcule which was watched for 18 days is capable of a four-fold increase in 24 hours, a rate of propagation which would afford in 10 days a million of beings.

Another powerful argument in favor of this vital and parasitical principle of malaria is the fact that many of our diseases are so produced by nature, and have been by artificial means. Dr. Klencke, says, he has succeeded in communicating to healthy animals, carcenoma, tubercle, melanoids, condylomata, warts, oyzena, coroyza, malignant pastule, and hydrophobia by the innoculation of the cells, the most rudimentary state of animal existence. Many other diseases owe their origin to parasitical animals or vegetables, amongst others the various forms of itch and ringworm. The thrush of children and the apthœ of adults, are according to Dr. Berg of a parasitical growth, and in the sporules of the cells very much resemble those of yeast. "Dr. Berg admits that the parasitic growth may be propagated in bodies previously unaffected, by sporules floating in the atmosphere, particularly under certain electro chemical conditions of the air and also of the bodies they effect" (Brit. and For. Med. Rev. No. xl.) We have also amongst the lower animals diseases produced by contagious parasites, as the muscudine of the silkworm and the vorticellæ growing on the toes of tritons, and causing gangrene. The last argument which I shall adduce in favor of the theory is, that all chemical agents which are known to destroy animal life, equally destroy the active principle of contagion and miasma, such as the fumes of acetic acid, chlorine, nitric acid, &c.; sulphur, and its preparations, as sulphurous acid, are powerful antiseptics, and are used to avert the decay of woody fibre. On the contrary, whatever tends to

favor the developement of animal life as warmth and moisture, likewise favors the developement of contagion and miasm. Excessive cold prevents the developement of contagion, as we see in Polar regions, and high dry heat acts in the same way. "Meat that would putrify in air in 24 hours has been kept without taint for as many days in a vessel containing air previously heated to redness" (Liebig); in this there is no change in the chemical nature of the atmosphere, but the germs of life which are the causes of decomposition are destroyed by the heat.

Supposing this theory of the vitality of miasm and contagion to be sound, we have an extraordinary fact, strikingly noticed in the jungles of America, and in the island of Pinang, easily explained, this is, that jungle that was healthy, when cut down becomes for a time the scene of malaria, and grounds that were fallow, when turned up, give forth miasm and produce fever &c, but after a time will again resume their innocuous character. When animal and vegetable matter is subjected, as in the cutting down of jungle and turning up of land, to warmth and moisture, fresh animal and vegetable beings are called into existence as the result of decomposition, during which state we have malaria active and producing fever; but, "as it is observed that the infusoria increase in size only to a certain point, it must hence be concluded, that their nourishment, even if only from the point at which they are to grow, passes out of their bodies in the form of excrements, precisely as in the higher order of animals." As it is the case with all other excrements, these must possess, in an eminent degree, the property of passing into decay, or putrifaction. Hence the increase of numbers of the infusoria must induce and accumulate the process of putrifaction in the putrifying body itself, until at last the ultimate products ("now sensible to our senses and chemical observations") are eleminated in the shape of carbonic acid, ammonia and water, and provided all the germs are reduced to that state, then the malaria ceases to exist and the production of fever is stopt. We have already come to the conclusion that there is either some malarious influence generated in the fresh water marshes of Singapore, which is not in those subject to tidal influence, or, if ge-

nerated in marshes subjected to tidal influence, that there is some counteracting agent, which renders the malaria innocuous. It is impossible to suppose that animal and vegetable decomposition does not take place in all rivers and swamps, subject to tidal influence, for we know to the contrary, that the vast accumulations at the mouths of rivers and even the formation of new land is the result of marine animalculæ (Ehrenberg.)* In fact taking an "a priori" glance at our fresh water marshes and our salt ones, few would be inclined to doubt that the latter, so far from being devoid of animalcular decomposition and formations, even exceed the others, and the researches of that distinguished microscopist Ehrenberg, have fully established that fact. I am therefore inclined to make this inference that *marshes under tidal influence equally with fresh water marshes generate malaria*; knowing the comparative healthiness of all swamps subject to tidal influence, another inference must therefore be drawn, *that there are some counteracting agents in marshes subject to tidal influence which renders the malaria innocuous.*

The first of these agents is no doubt the rise and fall of the tide, which, by dissolving and diluting the soluble and putrefying matter, retards, as in the manner explained, further decomposition, and consequently the formation of malarious germs, but the principal agent is in my opinion the formation of Sulphuretted Hydrogen. My reasons for making this startling inference are:

First. That by the experiments of many distinguished men Sulphuretted Hydrogen has been proved to be a most deleterious Gas to animal life, and even to vegetables. According to Thenard and Dupuytren, air containing only an 800th of Sulphuretted Hydrogen will kill small birds in a few seconds. Chaussier has found that air containing a 250th of it will kill a horse, and even applying it to the skin of a rabbit, the animal breathing natural air, has caused its death. As formerly stated it destroys vegetable equally with animal life. If it destroys the animals themselves, is it carrying the analo-

* That is, to a considerable extent. See Ehrenberg's results: *Sketch of the Physical Geography and Geology of the Malay Peninsula: ante*, p. 135.—ED.

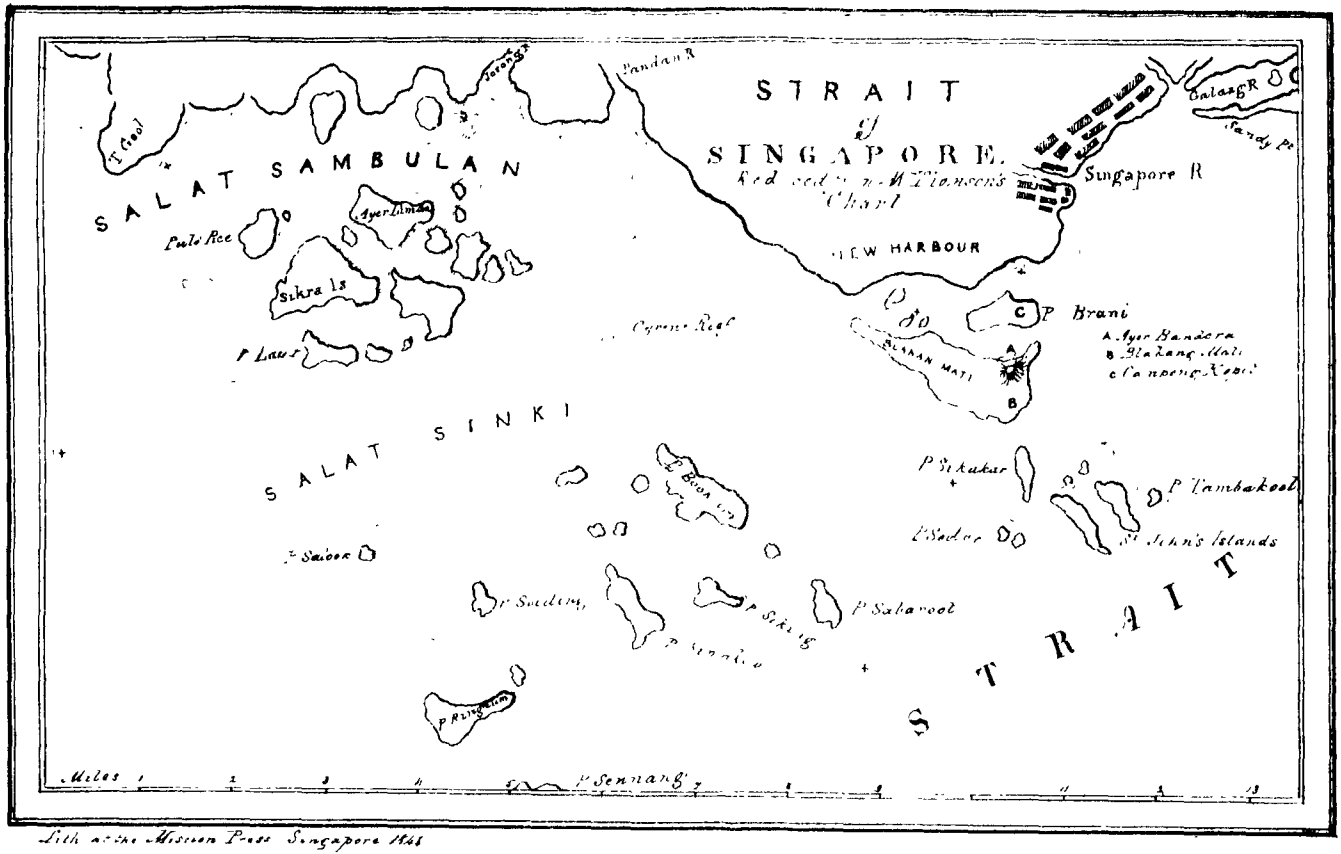
gy too far to say it will destroy the germs of animal life, the active principle of malaria?

Second. Sausages prepared in Wurtenberg are composed of very various materials; blood, liver, bacon, brains, milk, flour and bread, are mixed together with suet and spices; the mixture is then put into bladders or intestines, these after being boiled, are smoked. When these sausages are not properly prepared a peculiar kind of putrefaction takes place, and after a time Lactate of Ammonia is formed. In fact this process is nothing more than the formation of one kind of animalcule after another, until the ultimate product of Ammonia is formed. In this the resemblance to malaria is so striking, as to authorize me to conclude the action to be similar; and several hundred cases are known in which death has occurred from the use of this kind of food. In a case of poisoning from sausages mentioned by Liebig which occurred at Sausenbach in 1842, of all the remedies which were tried, Sulphuretted Hydrogen in water was found to possess very peculiar efficacy, and in the treatment the Sulphuretted Hydrogen water decidedly checked the poisonous action. In this case it was used as a *cure*, but *nature* here uses it as a *preventive*.

Third. In many situations where fever abounds Sulphuretted Hydrogen does not, and in situations where Sulphuretted Hydrogen is met with, in sufficient proportion, fever is not endemic. As instances of the first I may cite all fresh water marshes, all coral formations when there is fever as at the islands of Onrust and Edam, in Batavia roads, Blákán Mátí, Singapore; up the rivers on the west coast of Africa fever much more abounds than on the coast, while the amount of Sulphuretted Hydrogen is the reverse. Take this description of the slave coast—"these rivers are more frequented than any on this coast, their banks are however so swampy and the soil in general so richly wooded as to render commercial speculation an undertaking of surprising enterprise on the part of Europeans. We believe half of those who proceed on such a voyage never return; and we have known instances of one fourth only, during their short stay in this climate. The necessity for vessels proceeding some distance up these rivers in order to enter the field of traffic necessarily

brings them within the sphere of action of the malaria generated from the mud and decaying vegetables which continually cover their banks" (Johnson on Tropical Climates p. 349). As instances of fever not being endemic where sulphuretted hydrogen exists in abundance, the town of Singapore may be quoted, various parts of Paris where poudrette is manufactured, and localities in Edinburgh where the city sewers are allowed to empty themselves. The industry of man can easily counteract the malarious evils of fresh water swamps by drainage, but the malaria from saltwater swamps, or from localities where rivers join the ocean are far beyond his power; to me it therefore appears as a dispensation of Providence, the formation of this gas, that under ordinary circumstances is so deleterious to man, but, existing in situations where malaria is generated, is his salvation by destroying the vital germs, the active principle of malaria. In conclusion I would venture to suggest that this is the solution of the mystery for which Dr. McCulloch can offer no conjecture, that Singapore town, though possessing every imaginable circumstance that ought to render it unhealthy, even one of the most pestiferous spots under the sun, yet is a land where fever is unknown, and that freedom is owing to these swamps which surround it, being under tidal influence and disengaging Sulphuretted Hydrogen, which, although one of the most poisonous gases, yet under these circumstances is one of the most salutary, by destroying the animalcular germs, which are the vital principle of malaria, and I would have no hesitation in asserting that wherever mangrove swamps occur to any extent subject to tidal influence, and the disengagement of Sulphuretted Hydrogen,* in the Malay Peninsula, Borneo and other islands in the Eastern Archipelago, that provided there are no other causes of fever, these swamps will not generate malaria, and fevers will not there be endemic.

* Care must be taken not to suppose that every disagreeable odour is that of Sulphuretted Hydrogen, for in the majority of cases it is the ammonia odour of decomposing animal and vegetable matter.



Lith at the Mission Press Singapore 1848

BORNEO.

Several works relating to Borneo have recently been published in Europe. With the exception of Temminck's volume, from which we have already given some extracts, and Mr. Low's able description of Sarawak,* none of these are of a systematic nature, and the information which they contain, while always valuable and often new, is generally incomplete. The public attention having been thoroughly roused to the importance of Sir James Brooke's purposes and measures, and the British government having adopted them as their own by establishing the colony of Labuan, and investing the governor with political functions embracing the adjacent countries, correct statistical information respecting their population, industry, products, capacity of production, and commerce, is now required. How little this has hitherto been sought may be inferred from the fact that, although the capital of Borneo proper has been of late repeatedly visited by naval officers impressed, as they assure us, with the paramount importance of commerce, none of them have furnished us with any details respecting the present trade of Brunè. This is an omission the more to be regretted since the speculations in which they indulge as to the future commercial prosperity of Labuan, would have risen in trustworthiness in proportion as they were based on data derived from the actual trade of the neighbouring town. This and all other deficiencies in our knowledge of the northern part of Borneo, we may expect to see soon remedied through the enquiries of Sir James Brooke, and the intelligent gentlemen

* Mr. Low's work is emphatically a satisfactory one. There is a carefullness in his descriptions, and a justness and absence of prejudice in his opinions and estimates of native manners and character, which are not frequently met with. We expect much from his researches. He will pardon our remarking that the value of his labours would have been greatly increased, by giving the authorities on which statements relating to matters not falling within his own observation are made. An able original observer like Mr. Low impairs the value of his own contributions to knowledge by mixing them up with other facts which the reader may not be disposed to take on trust, and the authors of which, if given, he might consider not entitled to implicit confidence. This remark is made with reference to the vague, and careless assertions that we frequently find in writings touching on the Archipelago, and to the uncertainty in which much of its currently received history is still involved.

who have been appointed to assist him in establishing the new colony. In the mean time we have thought that some account of the traffic between Singapore and Borneo Proper might prove useful, by conveying a knowledge of the nature and extent of the actual commercial resources of the country. This we shall give in our next number. In the present we offer a few notices which may in some measure serve as an introduction, as they relate to subjects connected with it, and which the late works on Borneo have only slightly touched upon. The first of them will also assist in forming a just estimate of some of the views respecting the tendency of European intercourse with the natives of the Archipelago at the present day which occur in Sir James Brooke's Journals.* With the feelings which lie at the bottom of these views we entirely sympathise, but we would earnestly deprecate any attempt to enforce that seclusion from promiscuous contact with Europeans which Sir J. Brooke evidently deems it desirable to carry out to a certain extent, if practicable. We think it is so impracticable that we might as well attempt to oppose a law of nature.† Besides it seems somewhat in consistent to

* Those recently published under Captain Rodny Mundy's care far surpass the previous volumes in interest. But their great value consists in the unreserved manner in which Sir J Brooke's policy and proceedings with reference to his own principality are laid bare. Captain Keppel's volumes increased, instead of satisfying, the desire which prevailed in Singapore to know how far the personal interests of the owner of Sarawak, were concerned in the invasions of the neighbouring rivers by British men of war, and how far their presence had, in other respects, subserved these interests. We believe the Journals edited by Captain Mundy have put Sir James Brooke right with the public of Singapore, and we are glad of this, because we believe the opinions formed by a body of intelligent Europeans, placed so near to the scene of his operations, must, sooner or later, tell on public opinion in England. It is not in the nature of a highly wrought enthusiasm, such as that which prevails at present, or lately prevailed, on the subject of Borneo, to last, and when the somewhat jealous feelings with which Englishmen in general watch their governments have taken its place, the good opinion of the public of Singapore will be found to be not without its value to the government of Labuan.

† We made some remarks on this subject in a previous paper (*The Present Condition of the Indian Archipelago*, *ante*, vol. I. p. 20) and will discuss Sir J. Brooke's views more at length on a future occasion. The question demands anxious reflection, but the utter impracticability at this time of day of building, by any local policy whatever, a Chinese Great Wall between races, would alone determine us against a wasting of humanity and energy in a wrong direction, even if we were not satisfied, on wider considerations, that this contact of races, despite its frequent collisions and the suffering involved in them, is necessary for the advancement of mankind.

admit an influx of Chinese and Klings, and fear the comparatively slight and far less hurtful influence of any mixed body of Europeans. The only way by which the philanthrophic and religious public of England can effectually secure the ultimate and general advancement of the people of Borneo, and all other native races subject to English influence, is by elevating their own and their countrymen's character, till a Brooke ceases to be an extraordinary man. When the combination of humanity, just and liberal principles, and strong practical sense which the Journals exhibit, becomes the common characteristic of Englishmen, then, and not till then, will the bettering of our Asiatic fellow subjects and neighbours be assured. But while the chief labour for the ultimate amelioration of the natives of Borneo must be carried on in Europe itself, the present hour has also its pressing demands for work to be done upon the spot. The general character of educated Englishmen is in several respects though not in all, so far above that of the other races with whom the Dáyás mix, that we have no fear that the instruments who must be employed in effecting it will prove hurtful, although to a certain extent they will doubtless cut both ways.

NOTICES OF EUROPEAN INTERCOURSE WITH BORNEO PROPER PRIOR TO THE ESTABLISHMENT OF SINGAPORE IN 1819.

Discovery of Borneo by MAGELLAN'S *fleet during the first circumnavigation of the globe, and subsequent Spanish intercourse with Borneo Proper.*

ALTHOUGH it is probable that Borneo was previously visited by Portuguese from the Spice islands, or by vessels voyaging between Malacca and their possessions in the eastern part of the Archipelago, yet the earliest notice of the island occurs in Pigafettá's relation of Magellan's famous voyage round the world, undertaken by this great Portuguese navigator for the Spanish crown. After the discovery of the Philipines, and the death of Magellan in the piratical crusade against Mathan (Maktan), the expedition visited several of the other southern islands of the Philipine Archipelago, and then, sailing from Palawan (in 1521) "came next," in the words of Pigafetta,* "to the great and rich island of Borneo in lat. 5° 5' N. the city containing not less than 25,000 houses. The king was a Mahomedan of great power, keeping a magnificent court; and was always attended by a numerous guard. He sent several presents to the Spanish captains, and made two elephants be led out with rich silk trappings, to bring the Spanish messengers and presents to his palace. He has ten secretaries of state, who write every thing concerning his affairs on the bark of trees. His household is managed by women, who are the daughters of his principal courtiers. This country affords camphor, which is the gum of a tree called *Capar;* as also cinnamon, ginger, myrabolans, oranges, lemons, sugar, cucumbers, melons, and other fruits, with abundance of beasts and birds, and all other products of the equinoctial climate. The natives continually chew betel and areka, and drink arrack."

It is probable, from the proximity of Borneo Proper to the Philipines, that the Spanish intercourse with it was greater than that of

* Translation in Kerr's Voyages and Travels, vol x. p. 21.

the Portuguese. We have not access to any Spanish writers who enter into details on the subject, but it appears that attempts were made to conquer it which did not succeed. In 1573 an embassy was sent to Brunéwhich came to nothing, as the king had no desire to be on terms with the Spaniards.* In 1576 an expedition under Don Francisco La Sande, the second governor of Manila, attacked Brunéé, deposed the king who had usurped the throne, and reinstated his brother Sirela, who had repaired to Manila to solicit assistance, promising that the whole island (which did not belong to him) should become tributary to Spain.† Sirela was a second time dethroned by his brother, and in 1580 Captain Rivera was sent to restore him, which he succeeded in doing.‡ The Bornean Malays having joined the Sulus in some of their piratical expeditions to the Philipines, Major Monforte was despatched in 1645 to punish them. "He landed in Borneo, burned and destroyed all the towns within his reach, togewith great quantities of provisions and a number of vessels, and made about 200 prisoners."§ Mr. Hunt says that the Spaniards removed from the port of Borneo in 1646,‖ thus implying that they had previously been established there. But Zuniga does not mention the existence of a factory. From 1568 to 1664 the Spaniards had not intermitted their efforts to bring the Sulus under subjection, but in the latter year they concluded a treaty of peace with them.¶ If these islands had not been interposed between the Philipines and Brunéé, and afforded such constant occupation for the Spanish forces in repelling piracies along their own shores, and making fruitless attacks in return, it is probable that Brunéé would long ago have been annexed to the Spanish colonies. In 1685 Captain Cowley relates that the governor of Manila had concluded a perpetual peace with the king of Brunéé.** Since this period the Manila government

* Zuniga's Historical view of the Philipine islands (Mayer's translation, vol. I. p. 160.)

† Ib. p. 160. ‡ Ib. p. 164. § Ib. p. 282.

‖ Some particulars relative to Sulu &c., p. 92. (published at Bencoolen in the Malayan Miscellanies, reprinted in Mr. Moor's Notices of the Indian Archipelago.)

¶ Ib., (Moor's Notices p. 52).

** "The Spanish governor of Manila having found the sweet riches of Borneo, hath made a perpetual peace with this great king, who was always at war before. The articles whereof were, that the king of Borneo should

does not appear to have made any attempt to molest Bruné or form a settlement in the island. In 1750 the king of Bruné ceded to the Spanish a claim which he had to part of the island of Paragua (Páláwán)*.

Early Portuguese intercourse with Borneo.

It was not till eighteen years after the Portuguese had led the way into the Indian Archipelago, and six years after they had taken possession of the Spice islands to the eastward, that these adventurous and rapacious discoverers turned their attention to Borneo.† According to the Portuguese historians de Barros and de Faria, Don Jorge de Menezes discovered Borneo on his way to the Moluccas, of which he had been appointed governor. Although, as we have seen, he had been anticipated 6 years by Magellan's fleet, and he merely touched at the port of Bruné, an account of this first voyage by Europeans from Malacca to Bruné may interest our readers, and we therefore give it in the words of de Barros.

" Don Jorge left Malacca on the 22d. of August 1526, with 60 men, and two ships which he had brought from India, in one of which he himself went, and in the other Balthezar Ruposo, who was going as Factor. As there were two ways to go to Maluco, one via Jawa, (Java) and Banda, which is most frequented though longest, and a shorter one via the island of Borneo, which was not yet discovered, Don Jorge took the latter, because Pero Mascarenhas had given him orders to go by the new route, to prevent the detention usual

have war with all nations and people that were at war with the king of Spain : which we no sooner understood, but we went by the name of Spaniards all the while we lay there. The natives brought us fish in great plenty, with oranges, lemons, mangoes, plantains, and pine apples." (Captain Cowley's Voyage round the Globe, p. 24) This treaty is not mentioned by Zuniga.

* Zuniga, vol. 2. p. 110.

† Temminck however says that Lorenzo de Gomes touched at Bruné in 1518. (*Coup d'Oeil &c.* vol. ii. p. 134.) As he gives no authority for this statement, and it does not occur in de Barros, or any other writer to whom we have access, we hesitate to adopt it.

at Banda in waiting for the monsoons. And as Don Jorge was the first Portuguese that had navigated in those parts, we will give the particulars of his voyage.* Don Jorge leaving Malacca with Moorish [Malay] pilots, who were acquainted with that route, and coasting along, entered the Strait of Singapura, which is about the breadth of a gun shot,† and so shallow that in many places it has not more than 6 fathoms water, and a great many reefs which extend one to another. There he found that the land had so many elbows that it was necessary to use great caution in navigating it. Arriving at an island called Pedra Branco, which is much looked for by the pilots of those parts, he then steered for an island, which the natives call Pulogaia [Pulo Gájá] which signifies Elephant Island, the figure of which animal it represents. Proceeding from this to many other islands which abound in these seas, he arrived at Borneo at the port of the city, which is in 5 degrees N. lat. After sending presents to the king, and the king to him, he steered between many islands and reefs which lie on the coast of Borneo in 7 degrees, and are very dangerous, —admitting navigation only by day, with a man in the top looking out for shoals, which are not otherwise discernable than by the colour of the water. He arrived at St. Michael, which the natives call Cuguahoa, and passed the island of Mindanao, and went between it and the island of Taguima, which is on the other side of the channel, which Don Jorge kept to avoid the dangers."‡

After arriving at the Maluccas Menezes resolved to improve his discovery of Brunê. His first attempt to open an intercourse with it was rendered abortive in a strange and unexpected manner. In 1527, he sent Vasco Lourenso to examine the country more closely and establish a trade.§ Lourenso visited the king, and asked per-

* "Diago do Conto dec. 4 liv. 4. cap. 2, says, that the first that attempted to discover this route from Malacca to Maluco via Borneo was Antonio de Abreu in the year 1523 by order of Antonio de Birto Captain of Maluco, which said Antonio de Abreu, after sailing many days lost amongst those islands, put back to Maluco without finishing his voyage."

† *Berco*, (cradle) a kind of gun used in former times. This strait is probably the narrow one *behind* the island of Singapore, now called by us the Old Strait (by the Malays *Sálát Támbro.*)

‡ Da Asia. Dec. 4. Part I. p. 101. Don Jorge arrived at Ternate *eight months* after leaving Malacca.

§ Asia Portugueza. (Kerr's collection, vol. vi. p. 207.) In Harris's

mission for the Portuguese to trade in the island. To gain the king's good will and consent, he presented him with some very costly tapestry, on which the marriage of king Henry the 8th. of England with Catherine of Arragon was wrought to the life. The king of Borneo asked him what all the figures represented, but on being told what they were, and that the king of England was a crowned prince like himself, he suspected that the Portuguese intended to play him an ill trick by bringing to life all the figures, and through them destroying himself and his whole kingdom. He ordered the tapestry to be hastily removed, and would have maltreated the Portuguese, if Affonso Pires and some Moorish [Mahomedan] merchants had not explained the nature of the gift to him. However he forbade the Portuguese to come and trade, and ordered them to quit the island immediately.* Three years later Gonsalo Pereira, fourth governor of Ternate, visited Borneo on his way from Malacca, and made friends with the king.† De Barros gives the following account of this visit. "Gonsalo Pereira, whom the king Don Joaõ sent from Portugal as Governor of the Moluccas, before sailing received instructions from Governor Nuno da Cunha to sail from Malacca to Borneo, where he was to visit the king and take in the necessary merchandize for the Moluccas. Leaving Malacca in August 1530, and passing amongst many islands, he arrived at the port of Borneo. from which the island is named, as it is the chief city on it. He sent Luis de Andrade with presents to the king, and desired him to say that the king of Portugal and his Governor of India had sent him, Gonsalo Pereira, to serve the king in what he should order, because he greatly desired his friendship, and that his vassals should repair to Malacca to trade as they had

compilation it is said "it does not appear that before the year 1527 the Portuguese were acquainted with anything more than the name of Borneo, and with its situation, by reason of their frequently passing by its coasts. About that time Captain Edward Conil had orders to examine it more narrowly, and being once acquainted with the worth of the country they made frequent visits thither." Harris's Voyages and Travels, vol. I. p. 683.

* Abridged from the Dutch of Valentyn, Oud en Nieu Oost—Indien, vol iii. p. 213. The same account is given by de Barros (D. 4. P. I. p. 106) on the authority of Diago do Conto and other Portuguese writers. The Affonso Pires was a Portuguese, apparently from Malacca, whom Lourenso found at Brunè in command of a junk, which confirms our conjecture that the Portuguese were previously acquainted with the port.

† Valentyn, p. 213.

formerly done, where they would be well received, and that the Portuguese should go to his ports and enjoy the benefits of commerce. With this message of the Governor the king was highly pleased and replied with many agreeable expressions, offering his friendship and promising to do everything that was desired. On Andrade's return he sent with him two Mandarijs [Mantrís], with some presents, to visit Gonsalo Pereira.

"This king of Borneo was a Mahomedan, as well as all his subjects, rich, powerful and served with great state; he had a Governor who ruled the kingdom for him, and who, in his language, is named Zabandar. The people of this island are of a brownish colour, well made, well dressed and using a language like that of the Malays. The country abounds in flesh, rice and several kinds of food, and in merchantable products of the earth of great value. Near the beach close to the city of Tanjapura, there are found diamonds very fine and of greater value than those of India, and everywhere they find the true camphor in trees, as resin is found in Europe, and this is the kind which in India has so great a price, that imported from Persia being spurious. The city of Borneo is large, surrounded by a wall of brick, and possesses noble edifices where the kings reside and hold their sumptuous courts. In Borneo, Lave [Láwá], Tanjapura, Cerava [Sáráwá'), the principal ports of this island, there are many wealthy merchants who trade to Malacca, Sumatra, Siam in China, and other parts, to which they export diamonds, camphor, agala wood, provisions, and a kind of wine which they call Tampor,* which is the best of their artificial products. From this city Gonsalo Pereira departed, leaving the king very friendly, and arrived at Ternate in October 1530."† At a later period a Portuguese navigator named Pedro Teixera sailed along the coast from the western point to the harbour of Borneo.

After this event Valentyn did not find anything further relating to Borneo in the writings of the Portuguese.‡ "However" he adds

* Probably the light spirit made from the fruit of the Támpuí.

† De Barros, Dec. 4. Liv. vi. c. xix.

‡ Nor do we find that De Barros describes any visit to Borneo after that of Pereira.

"it appears clear from other writings that from time to time, they traded here very vigorously, and made great profits, just as they still drive a strong trade between Macao and Borneo in cloths, which they barter for so large a quantity of Pepper and other costly wares, that one year with another they load here 3, 4 or 5 ships with Pepper." Mr. Hunt, writing in 1812, mentions that there still remained at Brune two bastions and a curtain of a regular stone fort built by the Portuguese, and that they also had one on the island of Labuan.* According to him, they were expelled from Sambas in the year 1690 by the Dutch, and nearly about the same time from all their other possessions in Borneo. The year intended must be 1609. From the time the Portugeuse began to trade with Borneo, they occasionally sent priests, who succeeded in converting some of the natives principally pagans, for they made little impression on the Mahomedans. Some time before the year 1650 a priest from Macao came to Laijong Cayuap, apparently in the Banjermassing territory, and made 3 or 4000 Christians, but he was expelled by the kings of Banjermassing, and no other priest having since come, the converts relapsed into their old religion, retaining no other vestige of christianity than the crosses suspended from their necks.†

Early Dutch intercourse with Borneo Proper.

The first Dutch navigator who visited Borneo appears to have been Olivier van Noort. On the 26th December 1600 he brought his ship to anchor in the large bay of the town of Borneo, before which are some islands inhabited by fishermen. The king generally maintained here a flotilla of armed prahus to protect these fishermen, the fish being very abundant, as well as to keep the river free of pirates, and to convey information to him at the town, which

* It is more probable that these were Spanish works.

† Valentyn, p. 252. Dr. Leyden in his Sketch of Borneo, p. 24 (published in the Verh. Bat. Genoot. van het Bataviasch Genootschap, vol. viii.) gives a careless and incorrect version of Valentyn's statement

lies three miles up the river, of whatever happens. Van Noort sent a Chinese with a present to the king, to make known to him that he had come to his country as a friend, who only desired to procure food, water and other things for his money. Many praus visited him, laden with fowls, fish, and fruit for which he bartered cloth. He also received some nobles and oráng káyás, who behaved in a very friendly manner, and to whom he gave some presents that he might trade at liberty; but he ordered his people to keep a good watch, and see that not too many came on board at once, for fear of ill consequences. On the 25th the Chinese returned and brought news that the king, fearing they might be Spaniards, with whom he was at war, had at first been unwilling to allow them to land and to trade, but that now, being better informed, he desired that a Dutchman should land in order that he himself might better judge of the matter. Van Noort said that he would willingly comply, if the king would only give a hostage, and this being acceded to, he gave some fine firelocks and other weapons to be presented to the king in his name.

That things were not right however, and that the place was nothing better than a nest of rogues, appeared afterwards very plainly to this commander. On the 1st of January 1601 he saw about 100 praus assemble behind a point about a mile from his ship. A few of these approached his ship bringing some bags of pepper, but he having perceived their object, frustrated it, by ordering his people to take good heed and not to allow more than 2 or 3 to come on board. Many of them now pressed forward, but on the Dutch threatening to fire, they held off, asking why it was intended to shoot them, on which it was answered that they must go and lie at a greater distance from the ship, which they did. On the second night they made an unsuccessful attempt to take the ship by cutting her cable and causing her to drift on shore. Some pepper was procured but seeing that they behaved badly, and had nothing but evil in their minds, Olivier van Noort departed on the 5th of January.*

* Slightly abridged from Valentyn.—Oud en Nieuw Oost-Indien, vol. iii. p. 243. The account given in Harris is substantially the same. He tells

In 1604 van Warwyk procured some diamonds at Succadana, and in July of the same year, when he was lying at Patani, a junk with an envoy from Borneo came to him bringing 8 Dutch captives who had been taken, with their unarmed vessel. The king, being dissatisfied with this, now sent them to the admiral with a friendly letter, in which he also invited him to trade in his country. He and the nobility there had used the captives very well; but they had suffered many injuries from the common people.*

Of the proceedings of Van Warwyk, Hans Roef, Verschoor, Michielzoon and Samuel Blommart or Bloemmaertz, in extending the trade of the Dutch on Borneo we need not here speak, as they were almost entirely confined to the west coast, ending in the establishment of factories at Landak and Sukadana in 1608†, and one in 1609 at Sambas, where a monopoly of the trade was granted to them in exclusion of all other Europeans.‡ The factory at Sukadana was abandoned in 1623.§

Blommart in 1609 reported that Teyen on the river Lauwe, Sadong in Borneo Proper (the eastern boundary of Sarawak,) Mampawa and Borneo were the best places for trade. At Sambas, tidings were received that the people of Calca, Seribas and Melanuge

us that "the Dutch traded here for pepper with the Patannees, a sort of people of Chinese original." These must have been natives of Pátání on the Peninsula. We extract some further particulars from Harris.

"The capital city, bearing the same name, contains 3,000 houses; but stands in a dirty, marshy soil; so that they may go in their praws from one house to another. The inhabitants all go armed from the nobleman to the fisherman; and the very women have so much of the soldier in their composition, that, if they receive any affront, they presently revenge themselves with dagger or javelin upon him that gives it. This a *Dutch* man had like to have proved to his cost; for having some way disgusted one of these *Bornean* viragoes, she set upon him with a javelin, and had dispatched him, if she had not been prevented by main force. They are *Mahomedans* in point of religion, and so very superstitious therein, that they will sooner die than taste anything that comes from a swine; neither will they keep any of these creatures about them. The better sort of them have a covering of linen from the waist downwards, and a cotton turban on their heads; but the common people go all naked. They chew a great deal of Beetle and Aracca in this Island, which is also a mighty fashion in many other parts. The Dutch, seeing little hope of profitable trade here, sailed for Bantam, not extremely well pleased either with the country or its inhabitants." —Harris vol. i. p. 35.

* Valentyn. † Radermacher, p 44, 50.

‡ Valentyn, vol. iii. p. 245.

§ Dr. Leyden's Sketch of Borneo p. 25. (Verhandelingen van het Bat. Genot. vol. vii.)

had fallen away from Borneo, and placed themselves under the power of the king of Johore. These were places of large trade, where much gold, bezoar, pearl, and other rare articles were found.*

Although other Settlements were subsequently formed, they seem to have been neglected and ultimately withdrawn. During the latter half of the seventeenth century, the Dutch Company only occasionally sent vessels to the coast of Borneo, and it was not till 1712 that they resolved to re-establish a factory at Banjermassing. When the Commissioners arrived there however, they found that all the pepper had been carried away by the Chinese junks.

The narrative of Roggewein's voyage supplies us with some account of Borneo in 1721. It is there stated that "when the Dutch first settled in the East Indies, they were very solicitous about establishing their factories in Borneo; and accordingly they fixed them at the city of that name, at Sambas and Sukadana; but they soon found that there was no such thing as dealing with the inhabitants, who are certainly the basest, cruelest, and most perfidious people in the world. The Dutch therefore quitted the island, and though invited thither several times since have absolutely refused to return." "Yet," it is said at another place, "they frequently send their ships hither to load with pepper, and endeavour to keep up a good correspondence with the kings of Borneo and Sambas; for as to the king of Banjar he has declined to have anything to do with them." In 1747 they extorted a monopoly of trade from the king of Banjermassing and formed a factory at Tatas or Banjermassing, which was kept up till 1807-8.† In 1776 they established factories at Pontiana and Landak. In 1786 they sacked Sukadana and Mampawa and made an establishment at the latter. In 1790 they abandoned this factory and Pontiana.

We shall not further follow the history of the Dutch establishments on Borneo, as they do not appear to have made any later attempts to enter into relations with the king of Borneo Proper. A notice of their progress along the west coast has already appeared

* Valentyn.
† Dr. Leyden, p. 21. Malte Brun's Geography.

in this Journal, and we need not revert to the subject till we review the trade between Singapore and that coast, as we propose to do on a future occasion.

Early English intercourse with Borneo.

Of the earliest visits of English vessels to Borneo we are not aware that any account exists. Valentyn supposes that we began to frequent its ports about the year 1609, although he does not particularize any voyage till nearly a century latter. Captain Cowley visited it in 1685 and gives a short description of it in his Voyage round the Globe (p. 24.) In 1696 an English vessel went to Kotaringin.*

In 1702 the English established themselves at Banjarmassing. Their chief had his house on a raft of bamboos with platforms, on which no Englishmen but only Bugis kept watch. At the side of the river they had a fort of loose earth furnished with palisades, which was also guarded by Bugis and provided with 10 guns. The head of the Bugis was named Angi Boni, a follower of the Makasser Captain Dain Matara of Bantam. These Bugis, at one time numbering 200 men, were at last reduced to 100; several had also departed to Pasir and Koti, villages on the east side of the island, lying over against Celebes, and which for 40 or 50 years had been subject to the king of Goa or Makasser. To Pataman was the head of the free Bugis, who were about 300 strong.

The chief had brought an old ship here with 48 guns, and his lading consisted of some opium, Chinese stuffs, iron anchors, grappling irons, lead and Spanish Dollars, of which 300,000 belonged to the chief and 700,000 to the Company. With this he purchased pepper, &c.†

* Valentyn, vol. iii. p. 248.

† "When the English left their country they were 30 ships strong, divided under two flags, 15 proceeding to China, and the other 15 under this Captain (or general) Moor, whereof 8 proceeded to Bengal, 4 to the coast, 2 to

The English procured 40 Banjar gantangs of pepper for 1 Spanish dollar, and sold it again to the Chinese at the rate of 15 gantangs for a dollar.

At this time the English got into disputes with the people of Banjarmassing which led to a war, in which the English took 5 Banjarese villages, Banjarmassing, Banjar, Kayu Tingi, Tatas and Karta Pura. The booty which they obtained consisted of 7 metal pieces, 100 swivel guns and 20 koyans of pepper. The king of Banjar was then named Panomabahan, and was of the royal house of Sumbáwá, and the minister, Pangéran Purábáyá, was of the Makasser race of Krain Krongrong.

They did not concern themselves with the revenue of the country, but they received 3000 dollars for the expences of the war, and Captain Moor then restored 4 of the villages although he retained Banjarmassing for the residence of the English. They had not molested the Banjarese first; but these latter without justification had resolved to attack them by surprise; and the English, getting information of this, made war upon them, although at that time their force consisted only of 10 Englishmen and 40 Bugis.*

In 1706 Jacob Hoogkamer with some Englishmen, after being from Batavia, came to Banjarmassing, but getting into disputes with the inhabitants they were driven to their ships with much loss, while one of the ships was burned. Valentyn gives several details respecting this event but they are not very connected, and we prefer extracting the more circumstantial account given by Hamilton in his New Account of the East Indies:

" I heard Mr. Sylvanus Landen, who had been Chief of Borneo, say, that he much wondered why the Company of England should have settled a Factory at Banjarmassing, where they were forced for

China and Ilhere, from which we may form some idea of the extent of the English trade with China and Bengal. This Captain Moor spoke good Malay and asked a spy of ours, sent hither from Makassar, if Governor Beerninck had the misfortune, while he lay asleep in the palace of the king of Goa, to be attacked and run through by Sampuwala and thus murdered, a circumstance which the Boni interpreter had spread abroad in Java, and which he had heard from a Johore man who had come over from Java to Banjarmassing in November, 1701.—Valentyn.

* Abridged from Valentyn, vol. iii. p. 218.

several years to keep their factory on flotes of great trees tied together, and made fast to trees growing in the water on the side of a river with cables made of rattans; and when they built a factory, they were forced first to drive poles in the ground to make a foundation, as the Dutch do at Amsterdam, and raise earth on them to build upon.

"Captain Barry, a very ingenious gentleman, drew the plan, but died before the work was brought to any great forwardness, and Mr. Cunningham, who came thither from Pulo Condore, when the factory was cut off by their Macassar soldiers, came to the head of the Company's affairs. He was bred a surgeon, and had turned Virtuoso, would spend whole days in contemplating on the Nature, Shape, and Qualities of a Butterfly or a Shellfish, and left the management of the Company's business to others as little capable as himself, so every one but he was master.

"Their Factory was not half finished before they began to domineer over the Natives, who past in their boats up and down the River, and very imprudently would needs search one of the King's boats, who was a carrying Lady of quality down the river, which so provoked the King, that he sware revenge, and accordingly gathered an army, and ship'd it one large praws, to execute his rage on the factory and shipping that lay on the River. The Company had two ships, and there were two others that belonged to private merchants, and I was pretty deeply concerned in one of them. The Factory receiving advice of the King's design, and the preparations he had made, left their Factory and went on board the shipping, thinking themselves more secure on board than ashore. When all things were in a readiness, the army came in the night, with above 100 praws, and no less than 3,000 desperate fellows. Some landed and burnt the factory and fortifications, while others attacked the ships, which were prepared to receive them. The English had made fast nettings from the mizen to the fore shrouds, about two fathoms high above the gunnel, that they might not be too suddenly boarded by the enemy, and to have the opportunity of using their blunderbusses and lances before the enemy could get on their decks.

As soon as they in the ships saw the fleet approaching near them, they plied their guns with double round and partridge, and made a great carnage, but all did not defer the assailants from boarding, who when they got as high as the gun-wall or gunnel, were at a loss how to get over the netting, and so were killed with great ease. Some got in at the head door of one of the ships, and killed some English in the forecastle, but they were soon destroyed. The two great ships, though in danger, beat off the enemy with small loss, but the little ships were both burnt, with most of their men, and one Dutch gentleman who was obliged to flee from Batavia on one of the small vessels, was also burnt in her. His name was Hoogh Camber, [Hoogkamer] and he had been ambassador to the King of Persia.

"I heard some Chinamen say, who were there at the time of the engagement, that the English killed, (in two hours that the action was hot,) above 1,500 men, besides many wounded and maimed, but the English were forced to be gone from their Settlement. The King thought his revenge had gone far enough in driving them from their settlement, and finding the loss of the English trade affected his revenue, he let all English who traded to Johore and other circumjacent countries, know, that he would still continue a free trade with the English on the old footing, but would never suffer them, or any other nation to build Forts in his country. Several English have been there since, and loaded Pepper, and have been civilly treated; and the Dutch sent a ship from Batavia in An. 1712 to trade with them, but the Natives refused commerce with them."

Besides the Banjarmassing factory the East India Company had at one time factories at Borneo Proper* and Sukadana.†

Of the general trade of Europeans with Borneo during the last century we are unable to offer any exact details. Notwithstanding the jealousy and intrigues of the Dutch, the English East Company, although balked in their attempts to obtain a firm footing on the island, continued to send their vessels to its ports. Even at the Dutch factory of Pontiana they procured cargoes by the connivance of the

* Mr. Hunt says, that the remains of this factory still existed in 1812.
† Hamilton.

Dutch Resident, and after the factory was withdrawn they regularly repaired to it.

In 1763 the Sultan of Sulu ceded to the East India Company his possessions in the north of Borneo, extending from the river Kimanis to Cape Kaniongan, embracing the districts of Pappal, Maludu, Mangidora, and Tirun.* In 1773 a small settlement was formed on the island of Balambangan. In 1774 a resident was sent to Bruné who concluded a treaty with the king by which the English engaged to defend Bruné against the expeditions of the Sulu and Mendanao pirates, and the Sultan agreed to give Balambangan the exclusive trade in the pepper of Bruné.† On the 24th April 1775 a band of Sulus captured the fort of Balambangan by surprise, and carried away booty to the value of about a million of dollars. The establishment fled to Bruné where they were well received. The factory was continued there for some years later and then abandoned. In 1803 Balambangan was reoccupied by the East India Company, but as they derived no advantage from it they withdrew their establishment in 1804. No settlement has been formed on the northern districts of Borneo, nor has any jurisdiction been exercised over them, since this time.

Towards the end of the last century the rulers and people of Borneo Proper and the neighbouring country of Sambas abandoned themselves so recklessly to their piratical propensities, that all pacific intercourse with the great foreign trading nations ceased. English traders, with their usual daring perseverance, for a time occasionally sought to renew the trade, but the loss of the May in 1788, the Susanna in 1803, and the Commerce in 1806 with the cruel murder of the Europeans on board,‡ proved the country to have become thoroughly piratical, and the British hydrographer of the Asiatic seas warned our navigators that it was *certain destruction* to go up the river to the town.§

* Mr. Hunt's particulars relating to Sulu. (Moor's Notices p. 53.)
† Raffles' Java vol. i. p. 267. ‡ Hunt.
§ This emphatic warning is retained by the editor of the last edition of Horsburgh published in 1843, two years after Sir J. Brooke had established himself in Sarawak.

TRACES OF THE ORIGIN OF THE MALAY KINGDOM OF BORNEO PROPER,

WITH NOTICES OF ITS CONDITION WHEN FIRST DISCOVERED BY EUROPEANS, AND AT LATER PERIODS.

Origin of the Malay kingdom of Brunć.—From all the notices of the Portuguese and Spanish writers we may confidently conclude that Borneo Proper, when it first became known to Europeans three centuries ago, was noted for the same productions, inhabited by the same races, in the same stages of civilization, and with the same mutual relations, as at the present day. Malays from the Johore Archipelago and Sumatra between 300 and 400 years previously, had taken possession of the southern part of the Malay Peninsula, reducing the natives to a state of subjection, and establishing those relations with the Binua which still exist, and which naturally grew out of the respective civilization and character of the two races. The kingdom of Johore thus established, and preserving its existence, by the Malayan principle of fealty to the royal family, throughout the successive invasions and captures of its capitals of Singápurá, Máláká, Béntán and Johore,* appears to have extended its dominion or sent emigrants to Borneo at any early period.

In all ages the growth of Malayan states has been the same. The germ is the occupation of a river or river's mouth, most commonly by a few families, who have gone forth urged by enterprize, want, discontent with their lot, or oppression. Civil wars have been prolific of larger emigrations. A Malayan state, with a few exceptions, is only an aggregation of river settlements. The first colony is often under a Nakhoda who has touched at the river and found the soil fertile, the forest produce plentiful or the situa-

* It is singular what little effect the successive European conquests and dominions in Johore have had in breaking up the unity of the Malay kingdom. In 1511 the Portuguese occupied Malacca and it has remained under Europeans ever since. In 1819 the Johore Archipelago was politically separated from the mainland, and this disjunction was rendered permanent by the treaty of 1824 between England and Holland, yet the Malays of continental Johore, and even their de facto rulers, the Bindahara of Pahang and the Tamungong of Singapore, consider the sovereign of the Archipelago, the Sultan of Linga, as the Him Tuan of Johore.

tion favourable for trade, and the previous inhabitants, if any, either willing to allow the settlement of strangers, or easy of conquest. If it is successful, other rivers in the neighbourhood are afterwards occupied. The new settlements attract attention in the native country of the founders, where numerous scions of the royal family are always ready to become the leaders of colonizing enterprises. The Iám Tuán gives one of these authority over the new colonies, where his power is at once recognized as of divine right, and where he rules without more than a nominal dependence on the parent state. In former times princes and chiefs often placed themselves at the head of expeditions to open settlements (buká nagrí.) In the course of time, the new country becoming populous and strong, and the ties of consanguinity that bound the chief to the royal family of the parent state weakened, absolute independence is assumed. In this manner we may be sure the kingdom of Johore itself first took form, and not from any single company of adventurers, although it remained obscure until Srí Tríbuáná established himself at Singapore. In the same way, in all probability, the Johore Malays spread themselves along the northern and western coast of Borneo.* In the rivers the same relations with the natives would be established from the first as in those of the Peninsula, and there, as here, we find them lasting to the present hour.

We cannot now discover at what period the Malays first occupied Borneo. They were doubtless long preceded by Hindu-Javanese, but the flourishing condition in which Brunéwas found in the beginning of the sixteenth century, and the purely Malayan character of it and all the other rivers visited by the Portuguese, afford strong probable proofs that its origin was long prior to the final establishment of Mahomedanism in Java (1478). Mr. Crawfurd in 1824 mentions† that, according to the Borneans, the emigration from Jo-

* Islands seem always to have facilitated the extension of Malays, and those between the Peninsula and Borneo have from time immemorial been frequented not only by Malays, but by the ruder sea tribes of the Johore Archipelago.

† In an excellent paper on Borneo Proper which appeared in an early number of the Singapore Chronicle. It is given as an editorial, but the authorship cannot be mistaken.

hore took place 29 reigns previously, and before the Malays were converted to Mahomedanism. A visitor to Brunė in 1837 was informed by one of the most intelligent Pangerans that the number of rajas who had reigned was 29, although another made the number 24 and others 30. * Allowing 15 years to a reign he makes the year 1460 that of the foundation of the Malayan state. Mr. Crawfurd assumes 20 years as the average length of a reign, and thus carries back the event 580 years. This would give the year 1244, when the Hindu-Malay kingdom of Johore flourished under the name of its first capital, Singápurá. From 1160, the supposed year of the foundation of Singápurá, to 1723, twenty two kings reigned over Johore,† which gives 25 years as the mean length of a reign.‡ Applying this to Borneo, the state would obtain a greater antiquity than that of Singápurá.

From these data we seem warranted in assuming that the Malay rule in Brunė was established before the seat of the Johore power and commerce was transferred from Singápurá to Máláká, a circumstance probable in itself. It is by no means necessary however to assume that people from Johore or the Johore Archipelago could not have emigrated to Borneo prior to the foundation of Singápurá. The Sijárá Máláyu and other Malay histories represent Singapore as having been peopled not from Menangkabau, as is generally supposed,§ but from the neighbouring island of Bén-

* Notices of the city of Borneo and its inhabitants made during the voyage of the American Brig Himmaleh in the Indian Archipelago in 1837, (Chinese Repository, Vol. VII. p. 186.)

† Valentyn Vol. I. p. 352.

‡ From the conversion of the people of Banjarmassing to Mahomedanism in the end of the 15th. century to the year 1825 twelve sovereigns reigned there, which gives 27 years to a reign. (See Moniteur des Indes, Vol. I. p. 164. Temminck vol. ii. p. 176.) On the other hand we find the average length of a reign in the anarchical kingdom of Achin during a period of 579 years from 601 to 1180 H., to have been 16 years. Of the 35 kings who reigned during this period 11 were removed by violence. In the purely Malayan kingdom of Johore only one king has been killed.

§ It is curious to trace the progress of the now generally received opinion that Johore derived its population from Menangkabau. Van der Worm in 1677 and Valentyn in 1727 gave correct though imperfect digests of the Sijara Malayu and other Malay histories. Marsden in the 3d edition of his history of Sumatra retracted his previous opinion that the Malays of Sumatra had emigrated from the Peninsula, cited the account in the Sijara correctly from Valentyn and Van der Worm, but added an ingenious conjec-

tán, which had a considerable maritime population when Sáng Nilá Utámá (afterwards called Sri Tríbuáná) of Piémbáng settled there

ture of his own that the Maha Meru of the Malay historians was the mountain of Sungei Pagu in the Menangkabau country, and that the adventurers who established Singapura were from the suku Malayo in that country "one of the four great tribes."* Mr. Crawfurd adopts this conjecture† and, misled by Marsden's loose transcript or imperfect comprehension of Valentyn's notice of the sukus, tells us that the parent race, that is the Menangkabaus, consist of these four tribes, the fact being that they are the sukus not of Menangkabau but of the country of the Sungie Bua Bander to the south, which lies around Gunung Sungi Pagu. In Marsden's and Raffles' maps of Sumatra the inland part of this country is a perfect blank, the name being erroneously confined to its maritime division. The number of sukus or clans is very great and their names are various. Thus the Malays of Padang belong to 8 distinct sukus, one of which is also named Malayu. But Mr. Crawfurd does not rest his opinion merely on Marsden's misinterpretation of the Dutch authorities. This great authority goes further, and declares that we may believe the universal assertion of the Malays themselves that all the Malayan tribes, wherever situated, emigrated directly or indirectly from Menangkabau.§ Our own enquiries however satisfy us that neither the Malay histories, nor the belief of the Malays, support the opinion that Singapura was founded by a swarm thrown off by the inland people of Menangkabau itself. Singapura, as stated in the text, was founded by Malays from Bentan, and the Malays of the Peninsula at this day so far from considering the Orang Menangkabau, including those of the Sungei Pago Malayo as Orang Málayu, regard them as a distinct though allied people. Although there can be no doubt that both originated from the same stock, there are differences in manners, institutions and even to a certain extent in language, which, even without reference to their traditions and opinions, would render it doubtful to our mind, that the Malays of the principal states of the Peninsula are descended from the Orang Menangkabau. The existence of a suku Malayu in Menangkabau, which is the foundation of Marsden's conjecture proves nothing in itself as to the origin of the word, because if a considerable number of Malays from Sungei Malayu in Plembang resorted to Menangkabau the rulers of the latter would have placed them in a separate Suku. The same policy is followed by the Menangkabaus of the Peninsula, and both there and in Sumatra sukus are generally named from the places where the clan had its first origin. The Menangkabau traditions derive their kings, and even the first inhabitants of Sumatra from the country extending from the Plemtang to the Indragiri, and Malay histories relate that Sangsapurba from Plembang after visiting Java and Bentan ascended the Indragiri or Kuantan and was chosen by the Menangkabaus for their king. Plembang did not even form part of the region over which Menangkabau extended its dominion in ancient times. (Tijdschrift v. Neerl. Ind. vol. ii. p. 29.) Mr. Marsden's conjecture that by Maha Meru or Bukit Saguntang-Gunung the mountain of Sungei Pago is to be understood requires no other comment than that it is a mere supposition, unsupported by evidence, and contradictory of the Malayan histories which were his only authority for a derivation of the Malays of the Peninsula from Sumatra. As this eminently candid and sagacious author had only seen the French abstracts of these histories he could not have been aware of the extent to which his hypothesis departs from them.

* History of Sumatra, p. 330.
† History of the India Archipelago vol. ii. p. 375, 6. § Ib. p. 372.

and married a daughter of the queen. If a Malay kingdom existed in the Johore Archipelago before Sang Nílá Utámá removed to Singapore, it is probable that the rivers of the Peninsula were inhabited by the same race.* At all events this people, whatever was their geographical range, might have visited Borneo before Srí Trí-

The Bukit Segantang-Gantang is in Plembang and is now known by the name of Bukit Se buntang. (Verhandelingen van het Bat. Genoots. vol. ix. p. 60.) It may probably be shewn hereafter that the name Malayu having been carried by the clan to Singapore, and thence to the other maritime Malayan states subsequently formed, came to be applied by foreigners to all the people speaking the same or a similar language, At the time when Marco Polo visited the Archipelago the name appears to have been still confined to the first maritime state, which he calls Malaieur.

The primitive Malay stock of Sumatra from which all the civilised tribes were derived, appears to have been the ruse tribe still scattered over the interior from the Batta country to the extremity of the mountain ranges. From this stock civilized tribes probably originated not only in Menang. abau but in other parts of the great region extending from the Pakan to the straits of Sunda, and which, from its possessing all the large rivers as well as the richest inland vallies of Sumatra, would be favourable to civilization. The evidences of the language are almost decisive on this point. The people on the most southern of these rivers, the Tulang bawang, although so near to Java, preserve Malay as the bulk of their vocabulary. The same remark appears applicable to the people on the next river, the Plembang, with the exception of the greater number of the inhabitants of the capital who are of Javanese extraction. At the time when Sang Nila Utama left Plembang the people were Malayan according to the Sejara, a fact which the history of the Javanese confirms, for they inform us that the Javanese colony which settled at Plembang left Java in the reign of the last king of Majapahit,† or in the latter half of the 15th century. The people of the country along the western coast from which the feeders of the Plembang are derived also speak dialects essentially Malayan, and having a slight mixture of Sundanese (Malay Miscellanies vol. ii. p. 12.) The people of the other rivers to the north, the Jambi,‡ Indragiri, Kampar, Siak and Rakan are Malay. It is this whole region, and not merely the small country of Menangkabau in its N.W. corner, that we would regard as the primitive land of the Malays. The people on all its rivers must have had some intercourse with the Peninsula and the Johore Archipelago from times long before the foundation of Singapura, but whether for centuries or thousands of years it is hardly possible that we shall ever know. In all points in which the Peninsular Malays differ from the inland and purely agricultural Malays of the region in question they assimilate to its river and maritime Malays, and Malay history does not go back to a period when the maritime Malays were entirely confined to Sumatra.

* The Johore Archipelago was probably inhabited from a very remote period, anterior even to the existence of any race in Sumatra, by a maritime branch of the same people, radically Malayan, who are now found

† Dr. Horsfield ante p. 304 (where *first* is erroneously given for *last*) Raffles Hist. Java vol. ii. p. 126, 133. Crawfurd His. Ind. Arch. vol. ii. p. 302.

‡ In 1820 Lieut Crooke found the population of Jambi entirely Malayan (Anderson's Mission to Sumatra p. 398.)

buáná reigned in Singapore. That the ancient Singaporeans were of a maritime and not an inland agricultural race, may be inferred from their selecting as a settlement the best position in these seas for commerce, and one of the worst for agriculture.* The Malayan town of the 12th century made as rapid progress under Srí Tríbuáná as the English one did in the 19th under Sir Stamford Raffles.† It speedily became noted as a great emporium, and merchants flocked to it from all quarters.‡

in the interior of the Peninsula and of the southern half of Sumatra. Several tribes in various stages of civilization still possess the Johore islands. Though little known to Europeans they can never have been without Malay or Hindu-Malay visitors, for it was by the great rivers of Plémbáng, Jámbi, Indrágirí and Kámpár, before whose embouchures these islands lie, that the Hindus of Ceylon and southern India must have gradually carried civilization into the interior of southern Sumatra. The Indrágiri in particular appears to have been crowded with Hindu-Malay settlements, many of the numerous villages on its banks retaining purely Hindu names to this day. It was by this river probably that they reached the fertile plain of Menangkabau. We are inclined to think that the Malays on these rivers must have attained a certain civilization, in advance of the wandering mountain tribes, even before the Hindus came. If any colonies of the latter settled in the country they must have been few in their numbers or unaccompanied by women, for the present inhabitants, unlike the eastern Javanese, preserve no physical traces of Indian descent. If Hinduism was gradually introduced in the course of a commercial intercourse, the difficulties attending the hypothesis of Hindu colonization would be got rid of. It is very conceivable that Hindu merchants remaining in the country for a time and unaccompanied by women, like the Klings at this day, would be led to marry the daughters of the native chiefs, assume political power, obtain priests and architects from India, and engraft on the old republican-oligarchical governments of the land semi-Hindu monarchical dynasties, the representatives of which, at each generation of descent, would depart further from the Indian type, till all physical trace of foreign blood was lost. The Hindu-Javan influence was probably more modern and comparatively transient.

* That is, Malayan agriculture. The Menangkabaus are a purely agricultural, mining, and inland trading people, and consequently when they began to emigrate to the Peninsula, their proceedings were precisely the reverse of those of the Singapore colonists and indeed of all other Malays. They passed through the maritime districts, and sought vallies amongst the mountains of the interior.

† In fact it is to Srí Tríbuáná that the English are indebted for the modern Singapore. It is evident from Raffles's Memoirs that his eye was fixed on Singapore long before he visited it, and the enthusiasm with which he alludes to it in his correspondence as the ancient maritime capital of the Malays. shews that it was this circumstance that directed his attention to it and determined his choice. In a letter to Colonel Addenbrooke he almost in as many words admits this. "But for my Malay studies I should hardly have known that such a place [as Singapore] existed; not only the European, but the Indian world also was ignorant of it" (vol. ii. p. 18.)

‡ Sijárá Málayu. De Barros also tells us that "Singapura was the re-

Bruné must have risen into importance during the epoch of three centuries, anterior to the piratical invasion of the Archipelago by Europeans, when all the Malayan states of which Singápurá was the parent attained their most palmy condition. That the Malays never reached the same degree of maritime power and prosperity in Sumatra must have arisen from the western side of the straits of Malacca, throughout the Malayan region, being totally unfitted for sea ports, or even for the approach of vessels in the days when charts of soundings were unknown. It is curious that it was not till the twelfth century that it occurred to them to form a port on the other side, in the great highway of navigation to the eastward. Srí Tríbuáná could have but slightly anticipated the extraordinary and rapid spread of the race, and developement of a new phase of its civilization, which was to ensue from his occupying a good maritim position. The discovery once made was not lost. When expelled by the Javanese from their first settlement the Singaporeans neither fled to the eastern coast, retreated into Sumatra, nor remained in the Muar, but proceeded further up the straits of Malacca till they came to the first good locality for another sea port, with a harbour lying in the very channel of eastern navigation.

That no very populous and powerful state ever grew up in Borneo is partly to be attributed to its comparative distance from the Peninsula and Java, and its want of the commercial advantages of the ports on the straits of Malacca, but chiefly to the inferiority of the soil and to the large and simple indigenous population, which from the first impressed a peculiar character on the Malay communities, by pampering their indolence and rapacity. If the soil had yielded luxuriant crops of rice instead of gold and diamonds, Borneo would have become populous and great like Java.

The precise limits of Bruné at the beginning of the 16th century are not described, but as some of the early Portuguese writers mention the Malay kings or chiefs of Succadáná, Banjarmassing and

sort of the navigators of the western seas of India as well as of those of the eastern seas from Siam, China, Choompa (Ciampa), Camboja, and of the many thousand islands which lie towards the east." (Da Asia, Dec. 2. Part. 2. p. 1.)

other places, it may be inferred that Brunė had nearly its present extent to the south west, while to the north it included the territory long afterwards ceded to the Sulus as the price of their aid in suppressing an insurrection of the Maruts and Chinese,* and transferred by them to the English in 1763. At one time indeed, by the accession of a large Chinese colony under a chief, Brunė appears to have gained so great a preponderance as to conquer the Philipines and reduce the Sulu dominions to dependence. As the annals of Sulu record this fact there appears to be no reason for doubting its truth.†

The only passage in Johore literature where Brunė is introduced at any length, occurs in the historical romance of Hăng Tuá, the well known Laksimáná.‡ This accomplished and heroic man was returning from Májápáhit to Malacca when he was waylaid by the son of the king of Brunė. The assailant was captured himself and carried to Malacca where he was treated honorably and afterwards conducted back to his country by the Laksimana. The king gave the generous captor a hearty reception and on his return made him presents of camphor, kandagas, sumpitans inlaid with gold, mats and slaves.§

It does not appear that at this time (about A. D. 1390) Brunė was subject to Májápáhit, but in the succeeding century the Javanese

* Hunt's Sketch of Borneo. But this writer gives a different account in his paper on Sulu.

† Hunt's Sulu p. 5

‡ Of celebrated native characters of the Archipelago "the most distinguished beyond all compare" says Mr. Crawfurd, "was the Laksimana or Admiral of Mahomed king of Malacca, a chief endowed with a courage, prudence and resources, which enabled him for years, to make head against the conquering arms of the Portuguese who had the generosity to do justice to his great qualities." Hist. Ind. Arch. vol. ii. p. 288.

§ "Adipáti Sulok a son of the king of Brunė had heard of the Laksimana and of his visit to Majapahat. He proposed to his followers to waylay him on his return. Pretending to his father that he wished to go on a pleasure excursion amongst the islands, he got his permission, and sailed with 15 prahus. After some days he arrived at Tănjong Jaya kirta or krong where they came to anchor and waited for the Laksimana The latter having embarked to return to Malaka directed all his prahus to keep together as he had a presentiment that they would meet with enemies. On the third day they arrived at Krong. As soon as Adhipati Sulok saw the Laksimanas prahus he ordered his flag to be hoisted. The Adhipati distinguishing the Laksimana's prau made his people ask from whence it came and who was the Panglima? the crew replied "we are from Majapahit and bound for Malacca; our Panglimas names are Laksimana and Maha raja Siti. Where are you from and

annals mention it amongst the numerous conquests made during the reign of the last Hindu sovereign of Java. The influence of a much earlier Javanese colonization of Borneo, so well marked in the more southern countries, has left its traces to this day even in Brunê. Several common Malay words have been replaced by Javanese and Madurese and some of the titles are still Javanese.*

Character of the inhabitants.—The mild character, the peculiar manners and condition of the Dáyás or Bíájus of the interior, the "insolence and tyranny," of the Malays towards those who live in the proximity of their settlements and the independence of the tribes further inland, are described by the earliest European visitors as we

where are you going?" They answered, "We have no Panglimas; we are from Jimaja and on our way to the Laksamana." Adhipati Sulek then said, "If you wish well to us, take in your sails, and tell us the news from Majapahit." The Laksamana directed his people to take in the sails. Maha raja Siti said to him, "what think you orang kaya? these prahus look as if they intended to attack us." While he was speaking they fired at the prahu and struck the jongor, breaking it, but the Laksamana's prahu did not receive any injury. He prayed and then fired at the Adhipati's prahu. Smoke issued but there was no report, at which the Adhipati wondered. Meantime Maharaja Siti, angry at the breaking of his jongor, ordered his people to board the enemy. The crews of his and the Laksamana's boats on this took to their oars, and pulled towards the Adhipati's fleet, when all his followers retired to the rear, leaving only the Adhipati's prahu at anchor. The Laksamana called his slave Si Jaya to bring his arrows, and seizing his bow, fitted an arrow and took aim at the mast of the Adhipati's vessel which he hit and broke. Enraged at this the Adhipati ordered all his fleet to fire but the guns made no report. The Laksamana then took another arrow and discharged it against the Lelan which it broke. The Adhipati's followers seeing this, hoisted sail and stood out to sea, leaving the prahus of the Adhipati and Sang Raya tossing about. Despatching Maha raja Siti and Maha raja Dewa in pursuit, the Laksamana and Tan Rakna de Raja approached the Adhipati's prahu." The Adhipati was made prisoner, and taken to Malacca where he was entertained right royally by the Sultan. After the Adhipati had remained some time at the court of Malacca the Sultan sent the Laksamana to conduct him back to Brunê with a letter and presents. He was well received by the Pangeran and remained at Brunê 2½ months. At his departure the Pangeran presented him with 3 piculs of Camphor (kapor barus) 500 sets of Kandagas each of the value of a tael of gold for the Sultan, and 3 susuns for the Laksamana valued at 3 pikuls of Camphor, 10 Sumpitans inlaid with gold, and 200 bales of pajar mats. He also gave to the Laksamana 3 youths of Brunê and 5 bhars of Camphor for himself and 90 boys for the Orang Kayas who accompanied him. We need not tell the reader that all the Laksimana's deeds, both in history and romance, receive a mythical colouring.

* Similar Javanese vestiges are found on the eastern coast of the Malay Peninsula and even amongst the Binua of the interiour of Johore.

find them at this day. It is remarkable however that the practice of taking heads is not alluded to.

The character of the Malays of Borneo appears to have been the same as at present. The Portuguese and Dutch navigators represent them as bold, tyrannical, treacherous, rapacious, and with a strong tendency to piratical acts, while it is evident, at the same time, that much friendly and mutually profitable intercourse was carried on. "The Portuguese," says Harris, "could never succeed in subduing the Moors of Borneo." The Spanish were equally unsuccesful, and the Dutch and English East India Companies found in the character of the Malays an insurmountable obstacle to the permanent maintenance of trading establishments. The Europeans, it must be admitted, during the early part of their career were at least as rapacious and unscrupulous as the natives, and did not hesitate to use their power in a piratical manner whenever they could do so with success. We may hence surmise that having fully established their buccaneering character throughout the Archipelago early in the sixteenth century, the Malays learned at all times to fear and distrust them. Even when peaceably trading or settled in factories we must believe that the domineering and intolerant spirit which too generally prevailed amongst them, often led them to off end the pride and prejudices and disregard the social rights of the Malays. We must therefore hesitate to throw the blame on the latter, when we read of their treacherously surprising whole the vessels and rising against the factories of their visitors. It is too much the habit of Europeans even now to visit with indiscriminating indignation the reaction which takes place when Malays, after submitting for a time to a condition of things originating in force or a forced consent, are excited by a favorable opportunity, throw prudence and humanity aside, and become regardless of every thing but their wrongs and their revenge. Prone, like the European, to coerce those less powerful than himself when opposing his interests, it is not the less true that every injustice from others sinks deeply into the heart of the Malay. He is an Asiatic and has learned from childhood to hide his feelings when to show them would only procure an aggravation of his wrong. But if opportunity ever comes

his vengeance is greedy and cruel. There is a very obvious mode of treatment demanded by such a disposition from a race that considers itself superior in humanity and morality as well as in civilization and power. But we can hardly hope to see it fully tried until a century or two have passed, and meantime we must praise every attempt to approach it and make allowance for short comings.

It is not surprising that the Malays of Borneo Proper exhibited the same manners and civilization to the first European navigators as they do at present, because the Johore people had received their Mahomedan impress about two centuries and a half, and were navigators and traders at least three centuries and a half, previously.

Population.—We cannot with Mr. Hunt and Mr. Low adopt Pigafetta's statement that in 1521 the population of the town of Brunê was 25,000 families. The recent works relating to Borneo Proper shew how much statistics are neglected even by intelligent and educated Englishmen at this day, and we can hardly believe that Pigafetta had time or means to make an exact estimate. It is incredible that while the trade continued to flourish, as it did for more than 250 years subsequently, the population should have decreased from 25,000 to 3,000 families. Only 80 years after Pigafetta's visit Van Noort states the number of houses to be 3000. In 1636 Mandelsloe from other Dutch accounts, says the number was 2000,* and Valentyn, early in the 18th century, gives it at 2000 to 3000, "beside many country and garden houses outside."† In 1809 Mr. Hunt also makes the number of families 3000‡ "with a population altogether of 15,000

* Harris, vol. i. p. 787.

† "Where they sojourn to a great number, always armed with bows and arrows, and blowpipes" vol. III. p. 240.

‡ Moor's Notices p. 27. The later estimates are very discordant. In 1836 an Armenian gentlemen who lived in the town a year or two previously gives the population at 100,000 of which 20,000 are slaves (Singapore Free Press 15th Sept. 1836.) Mr. Low considers 12,000 to be about the number at present (Sarawak &c.)

Mr. Low mentions that 200 years after Pigafetta's visit (that is about 1721) the population of the town was computed to be only 40,000 (Sarawak &c. p. 106) and Sir J. Brooke says that Leyden states it at 4,000 or about 40,000 souls (Journals by Capt. Mundy vol i. p. 180). Leyden however makes no statement of his own, but says very loosely that "in the times of Valentyn it consisted of nearly 4,000 houses." Valentyn, as we have seen, makes no such statement.

souls". We think in may be concluded that the Malay population for the last 300 years has remained nearly the same.

Whatever may have been the population in the sixteenth century, there is no doubt that Brunė has always been the largest Malay town in the whole island. This circumstance probably contributed greatly to repel Europeans from attempting to form settlements, or rob the raja of his revenue by exacting trading monopolies, as they did at other places.*

The town of Brunė.—The best description of the town that has yet been published is that given by Forrest:

"The town of Borneo is situate, as has been said, about ten miles up the river from Pulo Chirming. The houses are built on each side the river upon posts, and you ascend to them by stairs and ladders, as to back doors of warehouses in Wapping. The houses on the left side, going up, extend backwards to the land, each in a narrow slip. The land is not steep, but shelving; every house has therefore a kind of stage, erected for connexion with the land. There is little intercourse from house to house by land, or what may be called behind; as there is no path, and the ground is swampy: the chief communication proves thus in front, by boats.

"On the right, going up, the houses extend about half a mile backwards, with channels like lanes, between the rows; so that it would seem, the river, before the houses were built, made a wide bason of shallow water, in which have arisen three quarters of the town, resembling Venice; with many water lanes, if I may so say, perpendicular and parallel to the main river, which here is almost as wide as the Thames at London bridge, with six fathom water in the channel; and here lie moored, head and stern, the China junks; four

* Most of the many failures of both the English and Dutch to form establishments in the Archipelago are attributable to the short sighted and too greedy mercantile policy by which the great monopolist Companies were actuated. They employed means inadequate to their ends, and thus provoked disasters. At the present day we may trace the taint of the same policy in the administration of Netherlands India. The only true principle in the Archipelago when hostility is manifested by the natives is to employ such a force as to insure rapid and complete success. It would be better still if such a force could always be displayed as to overawe opposition and prevent bloodshed.

or five of which come annually from Amoy, of five or six hundred tons burden. The water is salt, and the tide runs about four miles an hour in the springs. Some of the houses on the right side of the water are two stories high, which I never saw in any other Malay country, with stages or wharfs before them, for the convenience of trade. At Passir, on the opposite side of this island, the houses front the river; some have stages or wharfs in front; but there are no water lanes as here at Borneo. At Passir, the river is fresh, and often rapid; at Borneo, the river is salt, and seldom rapid.

" In those divisions of the town made by the water lanes, is neither firm land nor island; the houses standing on posts, as has been said, in shallow water; and the public market is kept sometimes in one part, sometimes in another part of the river. Imagine a fleet of London wherries, loaded with fish, fowl, greens, &c., floating up with the tide, from London Bridge towards Westminster, then down again, with many buyers floating up and down with them; this will give some idea of a Borneo market. These boats do not always drive with the tide but sometimes hold by the stairs of houses, or by stakes, driven purposely into the river, and sometimes by one another: yet in the course of a forenoon, they visit most part of the town, where the water lanes are broad. The boat people (mostly women) are provided with large bamboo hats, the shade of which covers great part of the body, as they draw themselves up under it, and sit, as it were, upon their heels." *

Productions and Trade of Borneo Proper in former times.— The commodities for which Brunê was noted and sought in early times were the same which supply its export trade at this day. Magellan's companions mention its camphor, Sir Thomas Herbert its " gold, diamonds, bezoar, lignum, aloes, musk, civit, benjamin, amber, dragons blood, wax, rice, and rattans." Valentyn gives the following list of its products,†

Gold (in abundance.)

* Voyage to New Guinea p. 380. † Vol. III. p. 237.

Diamonds (principally in the kingdom of Sambas, Lawe, and elsewhere.)

Pepper (over nearly the whole island.)

Cloves, Nutmegs } But not in great quantity, and only inland amongst the mountains.

Pearls (on the north coast only about the village of Borneo, and on Calca, Sambas and Melanuge.)

Camphor (in the kingdom of Succadana.)

Benjamin

Dragon's blood

Rattans, Calambae, Agalawood } in Succadana.

Iron (on the island of Karimata near Succadana.)

Copper.

Tin.

Bezoar, ape and goat stones.

Pedra de Porco.

Tutombos, or boxes made of fine rattans and leaves.

Wax.

Roggewein furnishes us with an intelligent notice of the trade in 1721.

"The Commerce of Borneo consists in as rich goods as any in the Indies. At *Sambas* and *Succadana* they deal in diamonds, of which there is a mine in the heart of the country. These stones are generally from four to twenty four carats; but the whole trade does not amount to above 600 carats in a year. They always sell stones for gold, though that likewise is the commodity of the Island; and there is a very considerable trade for gold-dust carried on at *Pahang*, *Saya*, *Calantan*, *Seribes*, *Catra*, and *Melanouha*. Bezoar of the finest sort, is another article in their trade, not at all inferior in its value to the former. Japan wood, fine wax, incense, martich, and several rich gums, are also met with here; but, after all, the staple commodity of the island is pepper, of which there is as much and as good, as in any part of the Indies. Our author mentions ano-

ther very valuable drug met with in this island, which is a stone he calls the Pork-stone, valued at so high a rate, as to be worth no less than three hundred crowns a piece. The Indian physicians, it seems, are of opinion, that, by exhibiting to their patients the water in which the stone has been steeped, they can infallibly discover whether they will live or die."*

Radermacher in 1775 gives the following account of the productions of Bruné.† "The products are pearls, bird nests, wax, *slaves*, rice and camphor. The Borneo camphor is the best, and after it follows that of Baras on Sumatra, both of which flow as a pure gum out of a tree hitherto unknown. Of the Bornean there is annually sold about 35 pikuls of 125 pounds for 3,200 dollars; and of the Sumatran 20 pikuls for 2,200 dollars. But the Japanese, which is a decoction of the leaves of a kind of laurel tree, yields not more than 50 dollars the pikul. The goods taken here are tin, cloth of different kinds and Javanese produce, particularly rice."‡

We can give no accurate details respecting the commerce of Bruné in previous centuries. The Borneans themselves appear to have always carried on a considerable external trade. The foreign merchants who most regularly visited them, and whose import and export cargoes were the most valuable, were Chinese from China, Siam, and Kamboja. European vessels also made visit from time to time, and the port must have long been frequented by traders from various parts of the Archipelago, and particularly from the islands to the northward.

When European and Chinese vessels ceased to visit the country in the early part of this century the only external trade until the establishment of Singapore appears to have been in praus to Sámbás Pontiánák, Tringánu, Linga and Malacca.§

* Harris vol. I. p. 307.

† Verhandelingen van het Bat. Genoots. vol. II. p 56.

‡ The substance of this account is borrowed by Dr. Leyden in his sketch of Borneo p. 6. (Verhandelingen van het Bat. Genoots. vol. VII.) without acknowledgment

§ Hunt's sketch of Borneo p. 58.

[*** The want of space obliges us to postpone the third of these short essays—"On the Chinese intercourse with Borneo"—till our next number.]

PREPARATION OF PINEAPPLE FIBRES IN SINGAPORE FOR THE MANUFACTURE OF PINA CLOTH.

Some time ago we observed, in the neighbourhood of Batu Blyer, a number of Chinese labourers employed in cleaning the fibres of Pineapple leaves for exportation to China. As we believe this to be a new and promising branch of industry in this settlement, where numerous islets are covered by the pineapple, it would be well to draw the attention of the Chinese and Bugis frequenting or inhabiting these islets, to the subject. The process of extracting and bleaching the fibres is exceedingly simple. The first step is to remove the fleshy or succulent side of the leaf. A Chinese, astride on a narrow stool, extends on it, in front of him, a pineapple leaf, one end of which is kept firm by being placed beneath a small bundle of cloth on which he sits. He then with a kind of two handled plane made of bamboo removes the succulent matter. Another man receives the leaves as they are planed, and with his thumb nail loosens and gathers the fibres about the middle of the leaf, which enables him by one effort to detach the whole of them from the outer skin. The fibres are next steeped in water for some time, after which they are washed in order to free them from the matter that still adheres and binds them together. They are now laid out to dry and bleach on rude frames of split bamboo. The process of steeping, washing, and exposing to the sun is repeated for some days until the fibres are considered to be properly bleached. Without further preparation they are sent into town for exportation to China.

Nearly all the islands near Singapore are more or less planted with pineapples, which, at a rough estimate, cover an extent of two thousand acres. The enormous quantity of leaves that are annually suffered to putrify on the ground would supply fibre for a large manufactory of valuable pina cloth. The fibres should be cleaned on the spot. Fortunately the pineapple planters are not Malays but industrious and thrifty Bugis, most of whom have families. These men could be readily induced to prepare the fibres. Let any merchant offer an adeqnate price and a steady annual supply will soon be obtained.

RANGE OF THE GUTTA TABAN COLLECTORS, AND PRESENT AMOUNT OF IMPORTS INTO SINGAPORE.

In the first number of this Journal, an account of Gutt Tábán appeared* which we are happy to inform our able contributor has been republished in a very great number of periodicals both in India and Europe, and has been acknowledged on all hands to be the best and most complete description of the Gattá that has yet been given. At a later period we gave some details respecting its collection by the Orang Binua in Johore.† At that time the principal supply was obtained from Johore, into the jungles of which parties of Malays and Chinese had penetrated in all directions, while nearly the whole indigenous population were engaged in the search. In consequence of the equivocal position in which Government appears to consider it politic to allow the Sultan to remain, the Tamungong has absolute power over the country, and it is to his energetic measures that Singapore has been indebted for a large part of the Gattá hitherto imported. Following the usual Malay policy the Tamungong declared the Gattá a Government monopoly, so as to secure to himself the greatest share of the profit on the product. The price allowed by him was a fair one, sufficient to induce the Malays to give the collection of Gattá a preference to other employments, and to leave them a profit of 100 to 400 per cent on what they procured from the Binua. The Tamungong himself sent out numerous parties of from 10 to 100 persons, and caused the tribes of hereditary serfs, such as the Orang Sletar, to be entirely employed in searching for Gattá. For the same purpose the Sabimba tribe were transported into Johore from the forests of Battam.‡ Subsequently the islands of the Johore Archipelago were laid under contribution, and "menábán"§ became the cry amongst all their land, river and sea tribes.‖

* Gutta Percha, by T. Oxley Esq., ante vol. i. p. 22.
† The Binua of Johore, ante vol. i. p. 261.
‡ Ante, vol. i. p. 336.
§ A word which the discovery of Gitta Taban has added to the Malay language. The greater number of Malay nouns admit of conversion into verbs by a prefix. Menaban, from taban, signifies to collect Gitta tabán.
‖ Ante, vol. i. p. 295.

The Tamungong's collectors even went as far as Lingá, and had procured a considerable quantity when the Sultan's eyes were opened to the value of his jungles. He confiscated a part of what had been collected, and, following the Tamungong's example, declared gattá tábán a royalty. At the period of our visit to the interior of Johore the Tamungong had made arrangements with the Bindahara to secure the tábán of Páháng.

The knowledge of the article has now slowly spread from Singapore in different directions, but we believe has not yet extended to the geographical limits of the tree. The Singapore collectors have almost everywhere been the first to carry this knowledge to the natives of the different countries. To the north the gattá collectors have reached as far as Perák on the Peninsular side of the straits of Malacca (embracing Johore, Malacca, Salangor and Perak), and Siak on the Sumatran side as far as Páné and Bílá. To the south the whole of the Johore Archipelago and the adjoining countries on the east coast of Sumatra as far as Plembáng (including the forests on the Kampar, Indragiri, Tunkul, Rite, Jambi and Plembang rivers) now furnish tábán. On the east coast of the Peninsula the knowledge of it has not yet advanced beyond Páháng. To the eastward it has reached some of the rivers of Borneo, such as Brunć and Sáráwák on the north, Pontiánák on the west, and Koti and Pássir on the east, coast. It thus appears probable that the range of the tábán embraces the whole of Borneo. It is remarkable that although a botanist, Mr. Lobb, saw numerous tábán trees in the jungles of Pinang, and Dr. Oxley in June last informed our mercantile readers there that it was found abundantly on the mainland opposite them,* they do not appear to have been able up to this moment to get a supply on the spot, and they seem destined to wait till the knowledge of the tree slowly reaches the Malays of Kedáh from Singapore. As it is now being disemminated in the adjacent state of Perak it will probably soon advance to the latitude of Pinang.† Although the Dutch

* *Ante*, vol. i. p. 24.

† Since writing the above we have heard that 12 piculs of taban have been lately brought to Pinang from the southern part of Province Wellesley, adjoining Perak.

have many able botanists amongst them, they too, it would appear, have been obliged to await the slow indigenous process by which useful knowledge is diffused in the Indian Archipelago.

The following statement of imports into Singapore from 1st January to 12th July last will give some idea of the present extent of the trade, and the relative proportion of tábán furnished by the different countries. They are taken from the daily entries made at the office of the Registrar of Imports and Exports. About one half of the tábán imported is not entered, but we have added the probable actual quantities.

I Malay Peninsula.

Malacca	225	piculs
Muar	11. 50	
Padang	25	,,
Batu Pahat	. 70	
Indau	155	,,
Simpang	50	,,
Pahang	126	,,
	593. 20	

The grerter part of the importations from Johore &c. are not entered at the Import and Export office. The imports for the Peninsula have been probably about 2500.

II. Johore Archipelago.

Rhio	559	piculs
Gallang	39½	,,
Linga	670½	,,
	1269	,,

III. Sumatra.

Siak	200	piculs
Kampar	632	,,
Indragiri*	20	,,
Tunkal	46	,,
Plembang	156	,,
Apong	2. 50	,,
Kubu	1	,,
	1066 50	

The actual importations were probably from 1500 to 2000.

IV. Borneo.

Borneo Proper	43.	piculs
Pontianak	2.	,,
Koti	10.	,,
	55.	

There has been an import of 19 piculs from Batavia.

Excluding a shipment of 448½ piculs made at the beginning of the year the exports have amounted to 6073-47, which must nearly represent the actual imports as stocks are not kept in the place.

The imports from Johore have greatly diminished since last year. The tree in many districts has become so scarce that the taban obtained does not repay the time consumed in searching for it. The chief supplies must now be looked for from Sumatra, the northern countries of the Peninsula, and, above all, Borneo.

The total exports of tábán from Singapore have been

in 1844, ...	1. 68	piculs.
1845, ...	169.	,,

* This is probably greatly under the mark. About 1,000 piculs are daily expected from Indragiri.

in 1846,.....	5364	,,
1847,.....	9256	,,
1848 to 31st July,	6768	,,

21, 598. 68 valued at $ 274,190.

The whole of this has been sent to Great Britain, with the exception of 15 piculs to Mauritius. 470. 68 to the Continent of Europe and 922 to the United States.

About 270,000 tábán trees have probably been felled during the 3½ years the trade has existed, and the value of each tree has thus, on an average, been about a dollar.

The price of taban in Singapore gradually rose from 8 to 24 dollars per picul, but last month it began to fall and is now about 13 dollars.

In our next we shall give some more exact details, and notice the mixtures of gattá percha, jelotong, gégrék, litchu and other inferior gattás, the products of different trees, which are sometimes used to adulterate the tábán. A large lump was brought to us a few days ago consisting of gattá percha and gegrek enveloped in a coating of taban about a third of an inch in thickness.

THE PROBABLE EFFECTS ON THE CLIMATE OF PINANG OF THE CONTINUED DESTRUCTION OF ITS HILL JUNGLES.*

It was remarked that the whole of the eastern front of the range [of a mountain in Pinang] has within a few years been denuded of its forest. The greater part of it is too steep for any permanent cultivation, and in all probability after the fecundity of the fresh soil, enriched by the ashes of the trees, has been exhausted, it will be abandoned by the Chinese squatters. It was not here alone that I was surprised to see the rapid progress which squatters and Chinese charcoal burners have made in destroying the jungles on the hills during the last two yeers. In Singapore the present zealous Governor has, in an enlightened spirit akin to that which has for some time distinguished the Government of India in reference to the same subject, absolutely prohibited the further destruction of forest on the summits of hills. Representations have been often made to the local authorities at Pinang, urging the necessity of reserving the jungles on the summits and higher slopes, but hitherto without effect. The reply has generally been, if the forests are of so much importance as the agriculturists insist, they must have a certain value to them and they are at liberty to purchase any tract they choose. But it is impracticable for the holders of land to unite in making such a purchase, and, were it at all practicable, the majority, from ignorance and selfishness, would refuse to contribute. But climate concerns the whole community, and its protection from injury is one of the duties of Government. In Germany and France there are special laws and departments for the preservation and extension of forests.

It is not necessary to cite Humboldt or Boussingalt to prove the great influence in tropical regions of forests, and especially of mountain forests, in attracting and condensing clouds, diminishing local temperature, and increasing humidity. But if the forests had no

* Extracted from a Description of a mountain range in Pinang written in 1816, and presented to the Asiatic Society of Bengal.

other effect than to protect the clay soil of the mountains from the action of the sun's rays, this alone ought to be sufficient to ensure their careful preservation. It is in this soil that the waters which supply all the streams of the island, and which percolate downward to the lower lands, are enclosed. These mountains are in fact great natural reservoirs, elevated in mid air and exposing the most extended surfaces possible, which are covered to a small depth with a sponge of porous decomposed rock for the absorption and retention of water. In ordinary seasons, when there is a considerable fall of rain, the importance of preventing the contents of these reservoirs from being dissipated may not be so obvious. But it may now be considered as a well established fact that the eastern Archipelago is subject to periodical droughts, although the laws of their recurrence are not yet ascertained. That such droughts will again and again happen, and are in fact in the settled course of nature admits of no question.*

Nature when left to herself provides a compensatory influence in the dense leafy forests, but if these are consigned to destruction, every successive drought will prove more baneful than the preceding. Unless government will reserve at least the steeper mountain tracts, which are not adapted for permanent culture, there is nothing visionary in the apprehension, for it has been realized in other localities, that in some prolonged drought, after the naked sides of the hills have been exposed for a few weeks to the direct heat of the sun, every stream in the island will be dried up, and universal aridity ensue. The great extent to which the plain of the mainland of Pinang has been shorn of its forests would of itself produce an urgent necessity for a stop being at once put to a war with nature, which must entail severe calamities on the future. In those mountains in Greece which have been deprived of their forests the springs have disappeared. In other parts of the globe the same consequence has followed. The sultry atmosphere and dreadful droughts of the Cape de Verde Islands are owing to the destruction of the forests. In

* See on this subject *ante* p. 110 "On the Physical Geography and Geology of the Malay Peninsula."

large districts in India climate and vegetation have rapidly deteriorated from a similar cause, and the government having become fully impressed with the necessity of respecting the stubborn facts of nature, every means have been used to arrest and remedy the mischief. Forests which had been so easily and thoughtlessly cut down have at great cost been restored.

NOTE.

[illegible] the destruction of the jungle on the mountains of Pinang has been allowed to proceed unchecked during the last 2 years. If one of the residents will bring it to the notice of the Governor we [illegible] the neces-sity of preserving hill jungle that he will not only make an order on the subject, but, what is essential provide means for carrying it into effect. [illegible] to the government jungles on the Pinang hills we would also suggest the preservation of the [illegible] trees. There is not a tree now left in Singapore, [illegible] southern Johore [illegible] 20 [illegible]. Before ten years are past [illegible] and [illegible] plants will be invaluable. The government forests in Pinang, if carefully protected would always yield a ready [illegible] supply.

M. H. ZOLLINGER.

As we have the honor of numbering this most enterprising and successful naturalist amongst our contributors,* we cannot allow him to depart from the Archipelago without an expression of our regret. For the last seven years M. Zollinger has in a tropical climate devoted himself to scientific research with an ardour which difficulties and fatigue have only served to excite the more. His botanical pursuits have carried him to the summits of the highest mountains in Java. During the last years of his sojourn he has extended his investigations to the hitherto undescribed country of the Lampongs in Sumatra on the one side, and the scarcely more known islands of Bali, Lombok and Sumbawa on the other.

"Following with brilliant results the footsteps of the distinguished botanists, who, in the last decennium, selected this Archipelago as the field of their researches, M. Zollinger has discovered a great number of genera and species hitherto undescribed. Of these he has described not less than 13 new genera, viz. *Guttenbergia, Gilgaspermum, Bombycodendron, Paracelsea;* Nov. gen. [illegible] *Trichocarpus, Odontostigma,* [illegible] *Cyclidocarpus,* and 107 new species, while numerous other new genera and species which he sent to Europe have been described partly by himself and partly by Professor Moritz, [illegible] a [illegible] were published in 1846 by Professor Moritz [illegible]"

[illegible] dervaluing other enquiries. [illegible] rocks and [illegible] plants. It is this genuine [illegible] well as the sensible aspects of nature, which [illegible] M. Zollinger's [illegible] of the Archipelago [illegible] but they are all of exceeding [illegible]

In an early number we shall publish an account [illegible] vered by M. Zollinger in the mountains of Bima.

† Address of the President of the Batavian Society of Arts and Sciences [illegible] the general [illegible]

contributed: A journey to the mountain Salakh (a monography); Observationes phytographicæ præcipue genera et species nova nonnulla respicientes, a series extending over 100 pages; Thoughts on the physiognomy of plants in general, and on that of the vegetation of Java in particular; Floræ Javæ species novæ by Prof. Moritzi and M. Zollinger; besides several shorter contributions, botanical, zoological and meteorological. He has also made valuable collections of minerals.*

To the Tijdschrift voor Neerlands Indie M. Zollinger has furnished papers of great value, such as accounts of his visits to Bali and Lombok, an elaborate Description of the Lampong country, and Contributions to a knowledge of the mountain systems of eastern Java. These papers are at once popular and scientific, and we long ago translated the greater part of them for this Journal. The number of original contributions which we have received has delayed their insertion.

* "M. Zollinger, already celebrated by his discoveries in the Flora of Java, has, during his numerous journies through the Lampongs and in the islands of Bali and Lombok, collected and presented to the Society many geological specimens, which are of the greater value from these parts not having previously been represented in the museum."—Ib. p. 71.

THE

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OF THE

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

A TRIP TO PROBOLINGGO.*

By Jonathan Rigg, Esq.

Member of the Batavian Society of Arts and Sciences.†

It having been arranged that the new barque Jane Serena should commence her adventures on the deep, by proceeding to Pahiton in Probolinggo to take in a cargo of Sugar for Singapore, I volunteered to go with her in order to expedite her movements as much as possible, since the approach of the north west monsoon rendered it adviseable to despatch the vessel as soon as practicable from the eastern shores of Java. I embarked at Sourabaya on Sunday the 22d. November 1846, soon after day break, and, as the tide had already begun to turn in our favor, the anchor was immediately weighed, and we soon drifted eastward past the roadstead.

The ship was under charge of one of the usual pilots of the port, who in this instance was country-born and appeared to be a steady respectable man, which cannot, however, always be said of his colleagues. The approaches to the harbour of Sourabaya, from seaward, either on the west or east, being impeded by mud banks, where the strait disembogues upon the sea, it is necessary to keep up a pilot establishment for the security and facility of shipping. The approach from the westward, past "Fort Lodewyk," formerly called "Fort Oranje," and now transmogrified into "Fort Erfprins," is less practicable than that from the eastward, or from the sea, south of Madura, so that deeply laden vessels, both coming from and re-

* In the east of Java: the richest sugar producing district in the island.

† Author of "A sketch of the Geology of Jasinga." (*Verhandelingen v. h. Bat. Genoots.* vol. xvii. p. 121); "Bespiegelingen over de Maleijers," (*Tjds. v. Neerl. Ind. 6. J. 2. o. p. 222.*) &c.

turning to Batavia, mostly prefer making the circuit of the island of Madura in order to gain this advantage, though the passage is often very baffling for want of regular land and sea breezes, on account of the little elevation of the island. At Fort Lodewyk, there are only 11 to 12 feet at low water. At high water, during the neaps, a ship will find 14 feet; at the springs 15 to 15½ feet, but, on account of the closeness of the Solo river, the sandy bottom is much harder than the soft mud on the eastern bank. At the eastern entrance, a ship drawing 18 feet may get out at the springs, but she will then be dragging through about 2 feet of ooze. These banks appear to be gradually shoaling, according to the testimony of long experienced persons, and it requires no great gift of prophecy to foresee that the consequences must, ere long, prove most disastrous for the port of Sourabaya, both as a place of trade and as a naval station for the government, this being the only safe and commodious harbour all round the coast of Java. As it is, the heavy ships of the Handel Maatschappy can only take in a part of their cargoes here, and must then proceed elsewhere to fill up; lately the Frigate "Ceres," after being engaged in the operations against Bali, would not venture over the eastern bar, but lay at Pasuruan, to undergo some necessary refitting and caulking. For the last 12 years, the government have been wrapped up in their hobby of building fortresses all over Java, to the neglect of the more peaceful and profitable improvement of their harbours and piers; yet it cannot be said that they have entirely lost sight of these objects, since they have lately sanctioned the construction of extensive dry docks at Sourabaya after protracted arguing on the subject since 1834. Another long talked of matter has been a "dredging machine." An Engineer came out from Holland nearly three years ago to put up the machinery, when the discovery was made that there was no fit boat to put it in. Lately a huge box has been completed: this however we need not expect to see fit for use for some months to come. The ground has been staked out for the dry docks close to the eastern pier head, but it will be the rising generation that will have the pleasure of smoking their pipes over the completion of the works. Large ships of war formerly visited the harbours of Sourabaya. In 1807, Admiral Pellew (afterwards Lord Exmouth) with 2 ships of the line, some frigates and smaller vessels, visited the Straits, and destroyed some timber and the shipping. This case I have heard instanced by M. Rambaldo, the present master attendant of Sourabaya, as a proof of

the shoaling of the banks; he was then a young man living at some of the batteries near Bankaliang and saw the ships of the line sa[illegible].

But to return to our pilot establishment. It [illegible] the expense of government and managed according to a regulation dated Buitenzorg 24th. January 1845, the principal features of which I here subjoin *

* No private individual sh[illegible] [illegible] except when all the pilots are absent, when the Master Attendent may give permission to such private individual.

No private individual may pilot [illegible] inwards, except [illegible] regular pilot outside.

All ships and vessels [illegible] pilot [illegible] pay half pilotage.

All ships or vessels, without exception, drawing six or more feet, must pay half pilotage even though the masters [illegible] to take a pilot on board.

Foreign ships [illegible] foreign [illegible] double pilotage.

The pilots are considered the servants of government and consist of

1 Head Pilot	paid f 100 per M[illegible]	
5 Pilots of the 1st class ..	.. „ 85 „	each
5 do [illegible]	.. „ 65 „	[illegible]
6 Apprentices	.. „ 35 „	do.

14 [illegible] Mayangs are kept at the expense of Government, [illegible] manned by 2 steersmen at f 8 each and 15 sailors [illegible] f3 with 40 lb [illegible]. these boats crews are natives, the Pilots and Apprentices are Europeans or country born. The [illegible] large mat sail, being also otherwise neat and clean. The stations for the Pilots and boats, are as follows.

At Sourabaya [illegible]	.. 5 Pilots [illegible]		[illegible] Boats
Sidayo, close to Point Pangka	.. 4	do.	5 „
[illegible]	.. 2	[illegible]	[illegible]

The Tariff of whole Pilotage is as follows

6 feet draught			f 20.	13 feet draught			f 48.50	20 feet draught			f [illegible]
7	..	do	23 50	14	..	do	55.	21	..	do	[illegible]
8	..	do	27.	15	..	do	60.50	22	..	do	110
9	..	do	30	16	..	do	[illegible]	23	..	[illegible]	132
10	..	do	33.	17	..	do	71 50	24	..	do	176
11	..	do	38.50	18	..	do	77.	With a proport[illegible]			
12	..	do	44.	19	..	do	82.50	chan[illegible]			

inches, for every quarter of a foot above the draught of 24 feet f 15 extra has to be paid — with a draft of only 19 feet of water [illegible] favorable circumstances, it may be considered superfluous to have extended the tariff to 24 feet, and [illegible] have [illegible] of f 15 for every quarter of a foot beyond that measure. To suspect, however, our worthy law-givers of such a piece of thoughtlessness, would be to do an injustice to their discernment. Large ships which must take all their cargo at Sourabaya, may on application to the Resident, obtain the *favor* of being allowed to go over the bank, and [illegible] to complete the remainder of their lading. The pilotage on such ships is calculated not on the shallow draft at which they are forced to cross the bank, but on the feet they draw when loaded outside, with nothing but the deep sea before them. Hence the necessity of such a comprehensive tariff, based

On leaving Sourabaya road for the eastward, the deep water for ships is near the Madura shore, the mud banks accumulating along the opposite coast of Java. Care however must be taken not to hug the Madura coast too close about a mile from the anchorage, and opposite a bare limestone cliff, where a hard reef runs out, on which the unwary stranger without a pilot on board has been known to stick fast and do himself some injury.

The coast of Madura is rather pretty; along the beach numerous villages are seen, ensconced among plantations of fruit trees and bambus, the ground rapidly rising beyond into a sloping ridge, 100 to 150 feet high. The substratum is a rock of limestone, which near a small valley rises up into fantastic towers and peaks. At the inner edge of the bank, and nearly opposite to the village of Gading, is seen a beacon of stakes rising out of the water, about half a mile from the shore. This stands on the sunken works of a fort built by Marshal Daendels for the protection of the eastern entrance to Sourábáyá. The foundations were laid in 13 feet water and 7 feet soft mud, but appear not even then to have rested on a firm bottom, since the fabric soon gave way and sank beneath the waves. Our pilot reported, that at very low water the works may still be seen, and that then the intermediate space to the shore of Madura is fordable. The mud bank is not above a mile across, but is of considerable length, extending from the villages of Gading and Boliga, on Madura, right across to the Java shore, which now instead of trending east and west, suddenly turns off due south for Pasuruan. From the bank, the green shores of Madura and Java, appear to narrow inwards like a *funnel*, terminating in the hills above Grissee known by the name of Girí; the shipping at the anchorage of Sourabaya may be seen near the bottom, on the left hand side. From this circumstance the Dutch call this entrance the "*Trechter*," which also means Funnel. Once fairly over the bank, the Pilot leaves the ship and returns to Sourabaya, the course south for Pasu-

on the principle that the less the service rendered, the greater shall be the charge, the lower figures being after the rate of *f* 3 to *f* 3½ per foot, the higher *f*. 4 and *f*. 5! The total amount of wages paid to the above pilots and boats crews, as well as cost of rice to the latter, does not exceed *f* 1900 per month. The merchant vessels visiting the port, average fully for the 12 months, one per day, and supposing them to average on arrival a draught of 12 feet and on departure 14 feet, the Pilotage would amount to *f*.2970, leaving thus a good profit in the hands of government. If they have further to purchase and keep the boats in repair, they on the other hand have the advantage of getting their men of war piloted for nothing.

ruan being free of dangers, though some sand bank are found, a little to the eastward, south of the Bokke Island. It was Sunday morning the 24th November before we could make the anchorage of Probolinggo, having been kept the whole of Monday boxing about with light or adverse winds, so that we anchored the second night only a couple of miles more to the eastward than the previous near Point Léko. As soon as we had deposited the ship passes with the authorities at Probolinggo, we were allowed to proceed down the coast to Pahiton to take in the sugars.

The neighbourhood of Probolinggo is easily recognized by a small island lying about 5 miles of the coast, called by the natives Pulo Katapang and by the Dutch "Krabbe" or Crab island. In Raffles map, this island is improperly laid down to the westward of the town of Probolinggo, whereas it is somewhat to the eastward, the anchorage for the shipping being westward of a line drawn from the Pier head to this island. The island may be a mile long and half as much broad, rises only a little above the surface, is barren and produces only a few stunted trees, except at the north east corner, where there is a little more green vegetation. Several houses are seen here and there erected principally for the convenience of fishermen. There are 10 to 12 fathoms of water close all round the island, except where a spit of coral rock runs out a short way from the eastern end. We set sail from Probolinggo with a fresh breeze off the land, being a peculiar wind that blows here during the prevalence of the south east monsoon, and known by the name of Ginding. In the course of a couple of hours we ran off 15 to 16 miles, and then sailing out of the tract of the wind, suddenly got becalmed. The course and edge of the Ginding were clearly marked upon the sea; where the wind blew, the water was lively and breaking in waves, whilst beyond, it lay sluggish and smooth as a mill pond. We could see the fate awaiting us; in less than 5 minutes, from spanking along at a pleasant rate the breeze slackened, died away, and our sails dropped to the masts, whilst the original impulse threw us from the fretful to the placid water. The Ginding is occasioned by the south east monsoon blowing right over the land, from the southern ocean, through the gap leading to Lamajarg, between the lofty Iyang and Tengger mountains, which tower into the atmosphere, right and left. some 8 to 9,000 feet, the gap between them at Klakka, only reaching to 1,000 feet. The Lamongan volcano 8,000 feet high stands in this gap, but we had the Ginding blowing from each side of it, and were not becalmed till we got

under the lee of the huge chain of the Iyang, I am told that the Ginding is as sharply defined to the westward as where we passed out of it on the east. This takes place about point Léko near Tongas, and on this side results from the interposition of the Tengger. The Ginding blows strongest and steadiest during July and August, and is not found to exercise any unwholesome effect upon the atmosphere, only persons much heated must be careful not to expose themselves to its chill current and thus suddenly stop perspiration. At Pasuruan, they have a somewhat similar wind, called Goronggong, which comes from the south coast at Melang, passing over the gap of Lawang 1400 feet high, between the Tengger and Arjuno. These are not the only points where the south east monsoon forces its way across the low land, between the high volcanic cones. The same wind, at the same season is felt very severely in the valley of Kadirí, between the Klut and Willis mountains, the hills on the south coast being here low limestone ridges. The island, however, being here so much broader, the wind has not sufficient force to maintain its ascendency as far as the north coast at Taban, but expends itself about Ngawi and Madion. About Sourabaya, under the protection of the huge mass of the Arjuno, none of these periodical winds are ever felt.

After lying becalmed for a couple of hours, we got a squall with heavy rain off the land from the Iyang, and having no certain knowledge of the appearance of the place we were bound to, it was considered prudent after a while to anchor; this we did at about 4 miles from the land, and here we remained till day light the next morning, whem we sailed further eastward along the coast till we distinguished some boats in a creek which we had learnt would mark our destination. I landed soon after at the village of Pasisir and found the creek nearly dry, being low water; loaded boats can only go in and out when the tide is up which, at this time of the year, takes place during the night. The distance from Pasisir to Pahiton is upwards of a paul directly inland along a cart track which runs beside a water course, coming from the sugar mill; you then cross the great post road and reach the Sugar Establishment on its southern side. Pahiton is a large village about one quarter of a paul further along the road to the eastward, and is the station of the Demang of the district. The 298th paul from Samarang stands nearly opposite his house, thus making the distance from Sourabaya 91 pauls.

The Pahiton sugar works belong to the heirs of the late Mr. Prætorius. This gentleman had formerly been a high officer of Government, his last appointment having been that of Director of Cultures; as such he had taken his pension, but after his return to Holland, the king had, in addition, conceded him a sugar contract in Java, to be worked with the machinery of De Rosen and Cail. The pensions which the servants of government enjoy, even after having spent the best parts of a life time in the east, afford but a very limited means of continuing the comfort and dignity to which they have been long accustomed. The increase of money payment being a thing which militates against the principles of government, they have for some years past been in the habit of conceding to old favorites or persons luckily possessed of court interest, advantageous sugar contracts in Java, with large advances to be repaid without interest. Amongst these favored few are, Mr. Prætorius, Mr. Holmberg de Beckfelt, formerly Resident of the Prianger Regencies, Lieut. Col. Luacssen, General Nahuis, Dr. Kempenaar, a court favorite, and now again lately Mr. Kruseman, a pensioned Director of Finance. As it does not always suit the Colonial arrangements to grant an entirely new contract, the parties get sufficient advances to buy out some old fabricant, when the establishment is remodeled and increased to suit the new objects in view. So it was with Mr. Prætorius; he took over the existing sugar work at Pahiton from John Condoo, giving him in part payment the concession lately granted by government for a new contract at Panarukan. Mr. Prætorius did not live long to enjoy the prosperity which was about to dawn upon him, having, in the early part of 1846, fallen a victim to the baneful climate of Pahiton. It is very extraordinary, that at intervals, and particularly during the wet season, both natives and Europeans are subject to very virulent fevers. There is nothing in the appearance of the country to give a clue to this insalubrity of the climate, nor does the rest of Probolinggo participate in this ill fame. The country is cleared and cultivated, dotted here and there with umbrageous village steads as is the case in all the rich districts of the island, no swamps collect stagnant water, the sea board is dry and above the reach of the tides, the beach being a clean sand and lofty mountains rise inland, at a distance of 5 or 6 miles. These mountains form the segment of a circle round the plain of Pahiton from the Iyang in the south, till they terminate on the sea shore at Gunung Tampora on the east. Whether this peculiar configuration

of the hills causes any stagnation in the atmosphere over the low parts of the country, I will not venture to assert, but that was the only apparent reason I could discover to explain the anomaly.

The machinery of De Rosen and Cail, pretty much the same as at Modjo Sari, is here in full operation, though the arrangements are less neat and convenient, from being crowded into less suitable buildings, which were erected for the old system. There are 600 Baus, each of 500 square roods, attached to the contract of Pahiton. Last year, which was the first season with the machinery, they made only 20,000 piculs of sugar, and this year will not give more than 24,000 piculs which is no great result for the fine lands of Probolinggo, when as much as 50 piculs per bau are sometimes obtained. The excuse made for this is, that the establishment has not yet had a fair trial, many of their buildings and arrangements being yet incomplete. After the death of Mr. Prætorius, the newly appointed administrator and manager Mr. van Barneveld was seized by the fever, not long after his arrival, in the commencement of the grinding season, at which time also a quarrel took place with the European Engineer, who through carelessness and neglect impeded the good working of the system. It is rather odd that though this machinery of De Rosen and Cail has now been working for four seasons in Java, no very satisfactory results have been arrived at, so as to prove it, as its advocates would fain have, superior to any other system. Bad lands, bad canes, bad water, bad engineers, bad buildings, or something else bad, in turn gets the blame of the machinery not doing the wonders which were promised from it.

The level lands of Probolinggo, composed of a dark colored garden soil, well watered, but with good drainage, lying between the sea, and the volcanic mountains of Tengger, Lamongan and Iyang, have under cane cultivation yielded the bests results of all Java. With every advantage of fine canes, the public authorities afford considerate assistance on the side of the population, and during crop season from May till the end of October, fine dry weather, almost without interruption, may be counted on. The following nine mills are situated in this district, and as their crops are about all secured, it is estimated that they will yield in 1846 as under:

				Piculs.
1. Bayuman of De Lange with			Baus, makes	20,000
2. Sumber Kareng of Potter & Van Aalst with	528	„	„	27,000
3. Umbul of C. Etty, ...	525	„	„	24,000
4. Wanolangin do.	475	„	„	19,000
5. Ginding, Horst	600	„	„	17,000

6. Kandang Jati of Spengler,..	..	..		„	„ 20,000
7. Pajarakan, Du Rook, ..	..	..	600	„	„ 24,000
8. Jabung of Chinese Ki King,	..	..	250	„	„ 9,000
9. Pahiton, Heirs of Prætorius,	..	..	600	„	„ 24,000
					184,000

Of these Pahiton works with the machinery of De Rosen and Cail, Kandang Jati with high pressure steam vacuum pans of van Blissingen and Dudok van Heil, whereas the mills of Wanolangin, Umbul and Sumber Kareng work with the low pressure vacuum pans of Howard; all the others have to use the usual open pans, after the old fashion. The mills of Nos. 2, 3 and 4 defecate their cane juice in double bottomed copper pans, heated by steam in the same way as in the process of De Rosen and Cail, but Mr. Etty seems to have a supreme contempt for filtration though animal charcoal. The most favorable results have been yielded by the mill of Sumber Kareng, which had its first crop in 1840, being then a new contract. The two first years they worked on the old system and subsequently with Howard's vacuum pans.

in 1840 they got	8,186	picul.	with open pans.
1841 „	10,641	„	with open pans.
1842 „	20.776	„	with Howard's vacuum pans.
1843 „	21,271	„	with Howard's vacuum pans.
1844 „	20,000	„	with Howard's vacuum pans.
1845 „	..		with Howard's vacuum pans.
1846 „	27,000	„	with Howard's vacuum pans.

Thus in 1846 they make more than 50 piculs per bau, and out of the 27,000 piculs delivered to Government, 20,000 are No. 18.—Umbul has also proved the great advantage of Howard's system; till 1840 they worked in the old way, making only on an average 9,000 piculs per annum, or about 17 piculs per bau; since then they used Howard's pans, and

in 1844 made 22,164 piculs or 42 piculs per bau

in 1846 „ 24,000 „ 46 „ „ nearly; compared with these results, the expensive machinery of De Rosen and Cail, put up at Pahiton, must still make a good deal more sugar per bau before it can compete with, much less excel, the more simple and less costly apparatus of Howard.

The establishments of Holmberg de Beckfelt and Lucassen are situated in Tagal, and at first promised no very flattering results; Mr. Lucassen has in a late number of the Tijdschrift voor Nederlands Indie (8 jaargang 10 afl.) published the results obtained at the

two mills belonging to each of them there, and worked by the machinery of De Rosen and Cail. The following was the result of the crops of 1845.

Owner.	Establishment.	Baus.	Obtained Kettles of juice ea: 1000 Nd. Kam.	Sugar Piculs.	Piculs. per Bau.
Holmberg,	Djati Barang,....	400	7155	14,317. 52	3 ¾.
„	Adiewarna,.....	400	9252	19,512.	48¾.
Lucassen,	Kemanglen,.....	379	6695	15,502. 55	40. scarcely.
„	Doekoewringin,..	421	6656	13,726. 27	32½.
		1600	29,758	63,058. 34	39½. nearly.

So that these mills, working in the second and third year, have not produced results equal to those obtained in Probolinggo with Howard's apparatus; it must however not be forgotten, that neither the soil nor climate in Tagal is as favorable as in Probolinggo.

Mr. Lucassen, anxious to have the capabilities of his system tested by the Government, invited them to send some person to watch the operation, during crop time. The Governor sent Mr. Schiff, inspector of cultures, who instituted an experiment from which the following result was obtained:

			Bundles.			Piculs.	Piculs.	
10 Baus	good canes	gave	21,395	yielded	767 Pots	656. 74	or 65. 67	⅌ bau.
10 „	middling	„	16,882	„	383 „	327. 94	or 32. 79	„
10 „	small	„	17,790	„	379 „	324. 52	or 32. 45	„
10 „	fallen	„	19,818	„	562 „	161. 28	or 16. 13	„
			75,886	„	2091 „	1470. 48	or 36¾	„

or excluding the fallen cane, the 30 other baus would average 43⅝ per bau. From the above statements we may fairly conclude that in Tagal, the machinery of De Rosen and Cail cannot average more than 40 piculs per bau, a rate at which the Pahiton mill will also barely arrive. The introduction of this expensive machinery can, therefore, be hardly adviseable, at least in the fine sugar districts to the eastward, when with proper management, even with the old open boilers, 45 piculs per bau have sometimes been obtained, as was the case, this year, at the very next mill to Pahiton, viz., Jabong, belonging to Ki King, the Captain Chinaman of Bezoekei, in a miserable establishment on the old plan, where they made 50 piculs per bau; but it appears that the Chinaman had bribed the village chiefs to

plant him *large* baus, though this the government authorities do not admit. This year however he is not making more than 30 piculs per bau, most probably for the double reason, of not having more land planted than by contract he is entitled to, and from having attempted to make a large portion of fine No. 18 sugar. He is thus forced to sacrifice weight for quality. The worst managed mill in Probolinggo, is reported to be that of Ginding belonging to Mr. Horst, attributable to bad arrangements, the authority at the place being divided between a European and a Chinaman. The only two mills further east than Pahiton, are that of Mr. De Rhiems, somewhere near Bezoekie, and the new mill of Candu, now taking off its first crop, and which is situated at Panarukan. Each mill gives 13 to 14,000 piculs.*

The population of Probolinggo is mostly Madurese, to the exclusion of the Javanese or rightful occupiers of the soil. This is said to have been occasioned some generations past, when the Dutch employed the Madurese as allies in their wars with the chiefs of Java, more particularly in the middle of last century, when these islanders played so conspicuous a part in the wars which desolated Java. The land of Madura is clearly seen from the shores of Probolinggo and Bezoekie, and the arid sterility of the island was no doubt a strong incentive for its inhabitants to keep possession of a rich province which the fate of war had placed at their mercy. The country, however, lay waste and neglected till the time of Marshal Daendels, when it was ceded to a Chinaman who made it his object to increase the population by encouraging the immigration of fresh families from Madura. During the time of the English government in Java, Probolinggo was the scene of disturbances and exposed to banditti, which led to the lands being resumed by the government.

The influx of this foreign population has given rise to a tenure of land other than is usual amongst the Javanese, as the rich level land has been portioned out in small hereditary family properties. This arose from the first immigrants acknowledging each other's exclusive right to the lot of land which his industry had cleared, and converted into productive sawahs. This individual right seems to be here clearly understood, and the lands are saleable and inheritable as in the Sunda districts. The heads of such landed families are known by the name of "Kápálá", and it is their policy to encourage as much as possible the further immigration of young, but needy

* See on the production of Sugar in Java, *ante* vol. i. pp. 194, 200.—Ed.

Madurese, who work their lands either for a share in the produce or a small assignment on their own account, as well as perform all the drudge work imposed upon the population by the government. The obligations, however, rest upon these Kápálás, and they must either send out their dependants or do the required services themselves. The Madurese occupy the low, flat, fertile plains, are distinguished by their own peculiar language, and managed by their own village chiefs, but the Demangs and other higher native authorities are Javanese, appointed by the government. The peculiar upland and badly irrigated soil of Madura causes the population there to make extensive plantations of Jagong or Indian corn. On removing to Java, the taste for this corn does not leave them, and it is everywhere seen planted, in the latter months of the year, as a second crop after the paddy. These Madurese are reported to be of more independent spirit and bearing, than the servile Javanese, who have been ground down by centuries of despotic sway. They are said to submit less willingly to services and work imposed upon them, but once at it, they are more active and handier than the Javanese.

Amongst the range of hills, at the foot of the Iyang, is found a scanty population of Javanese, who however live in great misery, gaining a precarious subsistence from their scraggy Gagas or clearings made yearly in the jungle. The south western side of the plain of Probolinggo is bounded by the Tengger mountains, where, as is well known, there exists a peculiar people who still cling to a form of worship, supposed to have had its origin from Hinduism, but which is now so far degenerated, that the similarity can scarcely be traced.

As in many other of the eastern provinces of Java, the Hindus, or their converts, have not failed to leave in Probolinggo, a monument of their skill and religious zeal. In this district, however, the antiquities are confined to the neighbourhood of Jabon. Here is found the Chungkup Jabon nearly opposite to the sugar mill of that name, about 294½ pauls from Samarang and thus 19 pauls west from Bezoekie and 21 east of Probolinggo. As Jabon is only a little more than three pauls west from Pahiton, and along the main post road, Mr. Barneveld had the kindness to drive me there on the afternoon of the 26th November. The building is situated a few yards to the south of the high road, and cannot be more than 20 feet above the sea, from which it is less than a paul distant.

This structure is composed of well burnt red bricks, particularly those used for the outer facings; what are used in the interior of the walls are not quite so good. It stands at least 50 feet high, and at the ground forms a square of 32 feet when measured through the centre, but the angles recede 6 feet 3 inches at each corner of the imaginary square, in consequence of the gradually diminishing basement on each facade. The building is placed with the greatest nicety east and west, north and south, as was shown by the small pocket compass which I had with me. The general form of the lower part is square for about one half of the height or 25 feet; above this it is round, but always preserving the plan of receding cornices. The centre of each facade of the upper or round part, on the north, east and south, is occupied by a false portal or window, over each of which grins the usual gorgon's head with goggle eyes. On the corresponding western face is a narrow doorway, up to which are traces of a flight of brick built steps, now ruined and fallen away, but it can be seen that their foot projected, on the ground, 8 or 10 feet beyond the general contour of the edifice. These steps must have been very steep, and indeed at very much the same angle as the present wooden stair case, which has been erected in their place for the accommodation of the curious who wish to inspect the upper part. This doorway is only about $2\frac{1}{2}$ feet broad, its threshold and receding lintels are composed of squared slabs of a trachytic conglomerate or pudding stone, and the rest of brick. It conducts into an apartment in the centre of the upper part of the building, which is found to be a square 8 feet 6 inches each way, slightly built up at the corners, however, so as to make it in some degree octagonal. The walls are of smooth brick, and overhead gradually draw inwards, in inverted steps, each diminishing till they terminate in a small square in the apex, on the same principle as is observed in the stone temples of Chandi Sewu. In passing inwards over the threshold, you go down three stone steps into the temple, and alight upon a small piece of floor. Opposite the door are traces of a former altar, and on the north and south walls we can see where the line of brick work ran, so that this altar must have occupied half of the interior space. Whether any image ever occupied this shrine it is now impossible to determine, since no vestiges of such remain. The altar indeed itself has disappeared, and a deep pit or well now occupies the centre of the floor of the building; but from the appearance of the place, it is evident that the thirst of man

for hidden treasures has led to this rude excavation in recent times, the solid brick work having clearly been dug out with iron crow bars. Behind the supposed altar is now found an opening through the thick wall, into which I could just creep and look out at the eastern facade. If there was originally an opening here, it must have been much smaller than at present, as the sides are now rugged and uneven from the brick work having been pulled out. There are holes and marks which show that the doorway was once fitted with an appropriate means of closing it.

In the centre of the lower part of the building, and thus nearly perpendicularly under the temple above described, is a quadrangular chamber 5 feet 8 in. square and 9 feet in height, in the midst of the thick brick work, to which, when the temple was in its perfect state, there can have been no admittance. The same inquisitiveness which caused the floor of the temple to be quarried out, has led to an aperture being made, at the level of the ground, from the eastern face, to this hidden chamber. The jagged opening was just large enough to allow me to creep into the dark recess, which I found tenanted by bats. The thickness of the brick work, from the outside, to this chamber is 11 feet 4 inches, and it must have been at a guess that the depredators broke into the place.

The building has been originally covered with ornamental devices, images and tracery cut into the brick.—These now are mostly obliterated and worn away, but in their place you can still detect figures of the cow and of human beings; and round the lower part runs a border, upwards of a foot broad, representing tigers and fanciful flower work. It is my impression and belief that the whole building has been originally covered, both inside and out, with fine plaster. We know with what perfection the natives of India, even at this day, prepare and lay on their Chunam plaster, polishing it till it rivals the smoothness of marble. In the native provinces on the temples built of hewn trachyte rock may yet be found traces of their having been plastered over, more particularly at Chandi Sarí near Kambanan; how much more likely then is it, that the buildings of brick should have been similarly treated. On close examination I found, both inside the temple and out, small particles of plaster still adhering to the walls, and which I proved to be such by detatching it with the point of a penknife. These bits of plaster on the outside I discovered on the southern face, on some of the figures of men and beasts, where the insertion of the limbs formed sheltered crevices.

The representation of this temple given at page 51 of Raffles 2d. vol. of the history of Java, still answers correctly to the original, except that the regular dome is now broken up, and from the ground appears a ruined heap; the gorgon's head over the doorway was also gone, leaving a vacant niche. As a building it thus remains pretty perfect, though the wear of centuries has not left it unscathed. The north eastern angle, the side next the sea, has suffered most from dilapidation; here many bricks have fallen away, leaving others loose and crumbling. This is the point at which the building will eventually tumble, but as the whole is so compact and solid, this calamity may still be delayed for many a year. In the course of time, the earth appears to have worn and washed away from about the edifice to the depth of at least 17 inches, that being the height of the lowest ornamental border to the ground, the intermediate space being occupied by eight courses of plain smooth brick. From this we may infer that none of the neighbourhing volcanoes have, during the last five or six centuries, spread much tufaceous matter or ashes over this part of the country, and on the same grounds conclude that no very violent earthquake or disruption of strata has occurred, since Jabon still stands free of rents. The safety valves in the Ringgit, Lamongan, Semeru and Bromo may account for this.

As already observed, the temple of Jabon is a brick edifice; the only exception to this, besides the lintels and thresholds of the doorway, are lintel pieces lying over each of the false portals on the north, east and south. These are all composed of a kind of pudding stone, hewn into shape for the purpose, and which already are crumbling on the surface with age, whereas the greater part of the neighbouring bricks are fresh and firm. The bricks are of the same large size as those found about the ruins of Majapahit, measuring 14 inches long by $8\frac{1}{2}$ inches broad and fully 2 inches thick. In the broken wall, I observed that the side of some of these bricks bore the marks of three fingers drawn along them when in a soft state, as is usual at this end of Java till the present day. The object which now a days is assigned for making these grooves, is to give the mortar better hold of the brick. As in all other ancient buildings in Java, so also at Jabon, no mortar or visible cement has been used is the building; the bricks all fit smoothly and evenly to each other, so that in most instances, the point of a penknife cannot be inserted between them. Whether any adhesive gum, glue or paste was originally used, re-

mains now a mystery and conjecture. The arrangement of the bricks is not always attended to with equal care; in the interior you may often observe the joinings continuous and in one line through three or four courses.

The temple of Jabon stands in the garden ground of the villagers, and at the distance of about 500 feet to the south west is found a smaller and apparently subordinate Chungkup, built also ornamentally of brick, but containing no internal temple or apartment, being as far as can be seen a solid monument. It is the same as represented in Raffles' vignette at page 63 and is about 20 feet high. It was reported to us that some brick remains existed a short way due west from the greater buildings, as well as some brick ruins of trifling importance a short distance to the southward; night and rain however coming on, we were obliged to make our retreat.

To the origin or history of Jabon I could get no clew. There the edifice stands, the wonder of the present generation of men! a monument of the skill and industry of a race, the memory of whom has long since passed into oblivion!—a dumb but lasting testimony of stirring scenes, and stirring beings, who have long slumbered the death of forgotten greatness! The appearance of the place leads to the supposition that it has been used for some religious purpose. Perhaps the lower and secret closed chamber, was the depository of some sacred relic, to which, however fantastic and trifling, we know that the Hindus, more particularly the Budhists, attached great importance. The small but nearly perfect temple at Singo Sari and the pyramidal building at Boro Bodur, both contain similar secret cells, and probably others may exist elsewhere, unknown to us. To what form of worship exactly Jabon was dedicated, it is now impossible to say, in the absence of all images. A species of Siwaism, however, appears to have prevailed in the latter days of paganism in Java. In this uncertainty, any attempt to trace an origin in the derivation of a name must be made with great diffidence, the more so as in this case the place is as often pronounced Jabong as Jabon. I will however venture to suggest that "Ja" (Clough 203) has the meaning of birth, production, and as such is allegorically one of the numerous names of Siwa and of Vishnu—"Bhu" is a place of being or abode, also the earth; these with the addition of the idiomatic Polynesian *an*, would contract into "Jabhon"—Siwa or Vishnu's abode. It was reported to me, by Mr. Barneveld, that there existed in some of the cane fields in the neighbourhood, a large stone image, appa-

rently of one of these deities, and if the following derivation of the name of the whole province is correct, it will lend further likelihood to the idea.

Prabala (Clough 442) much, great power or strength.

Linga (Clough 607) the Phallus, or Siwa under that emblem,—or as the Javanese would pronounce it, Probolinggo.

The only other antiquity of any moment, in this part of the country, is found on the south east slope of Mt. Semeru at a distance of 14 miles from Lamajang, near the village of Duku Penanggal, and is called Chandi Artapuri, and is also built of brick. (Tijdschrift voor Neerlands Indie 6 year No. 6. p. 379.)

On the top of the Argopuro, the pinnacle of the Iyang mountains, Messrs Bosch and Zollinger, at a height of upwards of 9,000 feet, have lately discovered, on the site of an extinct crater, the remains of what appears to have been once a religious establishment. These consist of a number of rude terraces, set round with stones and some enclosures also formed of unhewn stones. There is a sorby well walled up with stones and about six feet deep in the ground. The most extraordinary discovery in such an elevated and lonely place was that of a number of pots or jars, some broken, others whole. They stand about two feet high, have a mouth of about a foot wide, but belly out below; externally they are covered with a bluish glazing and have some ornamental work round the rim. No images were discovered. The controler Bosch was the first to visit the top of this mountain in the later end of 1844. (Tjdschrift, 8 year No. 2. page 161.)

(To be continued)

A SCHEME FOR REPRESENTING MALAYAN SOUNDS BY ROMAN LETTERS.

By John Crawfurd, Esq., F.R.S.

Sir William Jones' well-known scheme for representing Asiatic sounds by Roman letters seems to me to be chiefly defective from attempting more than was practicable. Its basis was the Dewanagri alphabet, and the Arabic, but other Asiatic languages contain sounds not to be found in either, and such an alphabet as would comprehend the whole of them would, I am satisfied, extend to at least 100 characters, and therefore be of intolerable length and prolixity.

Every language, or at least every class of languages requires, in my opinion, a system for itself, and if the native alphabet assumed as a basis be comprehensive and correct, that is, have an invariable character for every sound in the language, and such character is represented by an unvarying Roman letter, the task is at once accomplished. Such a scheme necessarily excludes the use of double letters to represent a simple sound, both as cumbrous and superfluous.

The languages of the Archipelago, in so far as the native portion of them is concerned, contain no sounds that do not equally exist in the European languages, and which therefore, with very slight modifications may not be easily represented by single Roman letters. The Javanese alphabet, the most perfect of those of the Archipelago, has written characters, not only for every sound in the Javanese language, but also for all the sounds in the other languages, with a few exceptions easily provided for.

Taking, then, the Javanese alphabet as the foundation of the scheme, the consonants will be 22 in number, and as follows, b. c. d. ·d. f. g. h. j. k. l. m. n. ñ. ñ. p. r. s. t. ·t. w. y. z. The letters b. k. l. m. n. p. r. and s. having exactly the same sounds as in most of the European languages, require no remarks, except that a final k., and sometimes a. medial, are, in Malay and sometimes in Javanese, pronounced as if they were mere aspirates.

The letter c. being redundant in the English system, and in it or the other languages, having, according to its position, two or more different sounds, I have selected it to represent a consonant for which there is a written character in nearly all the eastern alphabets. The sound is also of frequent occurrence in the European languages, but awkwardly represented by two or three consonants combined, and

which do not contain the elements of the sound. The English and Spaniards represent it by ch, the French by tch, and the Dutch by tj. The Italians represent it before the vowels e. and i. by the letter c., and I have adopted this to represent the sound universally, placing an orthographic mark over it, to obviate any ambiguity.

The first d. in the series above given is a dental, and the second marked by a dot is a palatal. They are carefully distinguished by the Javanese, but not by the Malays although both be exhibited in the scheme of their alphabet.

The letter f. as a native sound is unknown to the Malay and Javanese languages, and is confined to a few of the ruder tongues. I give to the letter g. invariably, its hard sound. The letter h. represents the simple aspirate, and, for the most part, occurs, in so far as native words are concerned, after a vowel,—in Malay and Javanese always so. The letter j. represents a sound for which there is a character in all the native alphabets exactly corresponding to its English pronunciation, but not to that of any other European nation. The Dutch represent it by dj, which do not contain the elements of the sound, besides being clumsy.

The ṅ with a dot represents a sound for which there is a character in all the languages of the Archipelago. It is the ng. of the European systems, and in the native languages is used as an initial, as well as a medial or final. After a vowel and closing a syllable it is represented in most of the alphabets by a dot over the consonant. The sound which I represent thus ñ, is taken from the Spanish orthography in which it appears as a substantive letter. It occurs in the Spanish word España, it is the gn. of the French and occurs with us in such words as union, onion &c.

In Malay and Javanese, there are two ts., a dental and a palatal, the first being of most frequent occurrence. The Javanese, but not the Malays, carefully distinguish them. I have marked the palatal with a dot as in the case of the palatal d. The letter w. has exactly its English sound, and y. is our consonant of this name which the Dutch and Germans represent by j. The letter z., like f., as a native sound, occurs only in a few barbarous and unwritten languages.

The liquids or consonants which coalesce with other consonants are l. r. w. and y.,—the two first very frequently, and the two last rarely.

The vowels of the Javanese alphabet, and they correspond exactly with the vocalic sounds of the Malay language, are six in number, and with one more will suffice to express all the vowels of all the lan-

guages of the Archipelago as far as we yet know them. They will be as follow : a. á. e. é. i. o. u.

The vowel a. has no representative in the Javanese or any other alphabet of the Archipelago except as an initial, but it is understood to follow every consonant, unless supplanted by the mark of another vowel, or suppressed by a sign of elision. Its sound in the Malayan languages is exactly that which it usually has in all the European languages, except our own, as exemplified in the Italian word casa, a house. The sound á. with an acute accent is intended to represent a Malayan vowel which in the Javanese alphabet has a distinct mark. It is the u. of the English words " but" or " cut".

The vowel e. has a peculiar character in the Javanese, and, indeed nearly all the other native alphabets. It has the sound which occurs twice in the Castilian word elevar, to raise. It is the é. in formé of the French, and the unaccented e. of the Italians in the word legge. The é. with an acute accent represents a sound, frequent in the Sunda language, and some other little cultivated tongues, but it has no character in any native alphabet. It is frequent in the Celtic dialects, and approaches in sound to the French u.

The sound of the native vowel represented by i. is the Italian one in the word Italia, and not the dipthong sound which we ourselves whimsically give it. The o. has a distinct character in the Javanese alphabet. It is the o. chiuso of the Italians, and the o. which occurs in our word " tone". U has also its peculiar character in the Javanese, and indeed, in all the other native alphabets. The letter is pronounced as in the Italian, Spanish and German, and it is the oe of the Dutch, the ou of the French, and the oo of the English.

In writing native words, it is to be observed, that the vowel, except when long, and sometimes even then, is inherent in each Arabic consonant, as in the native systems. The same is the case with i and u at the end of a word.

The dipthongs are but three, ae. ai. and au. In the Javanese alphabet, they have no peculiar characters to mark them, but are simply expressed by the sequence of the vowels which compose them. It may here be added that neither in the Javanese, nor any other alphabet of the Archipelago, does there exist a distinction by express characters between long and short vowels as in the Dewanagri. They are long or short, or more correctly, accented or unaccented, according to their position in a word, and in the vast majority of words, the accent of bisyllables is on the first syllable, and of poly-

syllables on the penultimate. Indeed there are hardly a score of examples in the Malay or Javanese of the accent being on the last syllable.

The system thus sketched would be sufficiently complete, if the paramount language, the Malay, had not been written, as it invariably is, in an Arabian character ill suited to the purpose. The Arabian alphabet, imperfect in itself and even for its own particular purpose, is preposterous when applied to the languages of the Archipelago, the genius of the pronunciation of which is far more at variance with that of the Arabic than of the languages of the south of Europe. It wants eight letters which the Javanese alphabet and the Malay language have viz. c̄. ·d. g. ṅ. ñ. and ·t, and it supplies their place by diacritical points over their respective cognates, while it has no less than 12 which no native alphabet possesses, and which, for the most part, are unpronounceable by the inhabitants of the Archipelago.

The Malays cannot pronounce most of the peculiar consonants of the Arabian language, and have a repugnance even to several of the vowels. A few only, ambitious of some literary or religious distinction, ape an imitation of the Arabic pronunciation, and the multitude reduce the Arabic to the standard of their own enunciation, as we ourselves did in adopting the Norman-French portion of our language.

The discordance which exists between the orthography and pronunciation of Arabian words adopted by the Malayan nations, makes it therefore necessary, in order to preserve the one and exhibit the other, to adopt a double system for every word.

I represent in the following manner the Arabic letters which have no representatives either in the languages or alphabets of the nations of the Archipelago ġ. ḥ. k. ḳ. l. l̈. s̈ s. s̄. t. z̄. z. I give them in the order of the Roman alphabet, classing them with their cognate letters.

The Arabian f. as I have stated before, occurs, as a native letter, only in the languages of a few of the ruder tribes. In the more cultivated it is almost invariably transformed into p. The ·g marked by a diacritical point is the well-known Arabian guttural called ghain, and our Northumbrian r. Its native pronunciation is simply that of g. hard. The ḥ. with a dot is the strong Arabian aspirate; and to which there is no sound equivalent in the Malay languages. The k̄. thus marked is the guttural called kha. It is the sound which is of such frequent occurrence in the Celtic and most of the

Teutonic languages, the German ch., the x. of the old, and the j. of the modern Spanish orthography. The k. with a single dot is a deep hard guttural which has no equivalent in any European language, and still less is there any approach to its sound in the Malayan tongues. Both these letters have the native pronunciation of an ordinary k.

The two letters l, represented respectively, by a single and by a double diacritical mark are the 15th and the 17th of the Arabian alphabet, called by the Persians zad and za. The Arabs, however, give to both a sound which approaches nearest to the double l in Welsh or Spanish. The Malayan nations pronounce them as a common l.—Of the three s. noted by different orthographic marks, the first is the swad of the Arabs, or 14th of the Arabian series, and the second the 4th Arabian letter, which the Arabs pronounce like our th aspirated, as in the word "thing"; but the Persians like an s. The Malays give to both letters the simple hissing sound of an ordinary s.

The third s. is the 12th letter of the Arabian series, the English sh, the French ch, the Dutch sj, and the German sch. With the Malayan nations it is, like the two letters which precede it, only a simple s.

The t. thus marked to distinguish it from the native palatal ·t, is the toe of the Arabs, but, in utterance the natives of the Archipelago make no distinction between it, and an ordinary dental t. The z. without a diacritical mark corresponds with a sound which exists in some of the ruder languages of the Archipelago, but is unknown to the written ones now in use. It is the 11th letter of the Arabian series immediately following r, and distinguished from it only by a dot above it. The ·z with a diacritical mark is the 9th of the Arabian series immediately following the letter d. and distinguished from it only by the point. Both these letters are pronounced in the same manner, and as an ordinary z. They may indeed be said to be the only peculiar letters of the Arabs that can be pronounced without much effort by the Malayan nations, but even these they not unfrequently convert into a j.

The difficulty of rendering the Arabic vowels by Roman letters is still greater than of the consonants. Of the three vowels which form substantive, alif, wa and ya, the first alone invariably expresses one sound, which is that of the inherent a in the Hindu and insular alphabets, but, as in these, it is for the most part expressed in the consonant, at the end of words, always.

With the letter wa, the power is not only that of two vowels u. and o, but also of the consonant w. As a vowel, it may be invariably expressed by u, for the natives themselves do not always clearly distinguish between the u and o.

The letter ya is not only the two vowels e and i, but also the consonant y. As a vowel I represent it invariably by its most frequent sound of i. In the Arabic Malayan alphabet, in order to distinguish the vowels from the consonants in the case of both letters now under consideration, a double letter is used at the beginning of words, which consists without distinction either of the letter, a. or the soft aspirate humza. I have no doubt that this was borrowed from the lost alphabet of the Malays, on which the Arabian scheme was formed, for it is analogous to the practise of the Javanese and other native alphabets in which the vowel a is considered as a substantive, and its power changed by the application of the other vowel points. This native a is evidently represented by the Arabian alif aspirate which is never pronounced.

In the system adopted, therefore, the Arabic letters wa and ya will be represented, according to their position in a word, either by w. and y. as consonants, or u. and i as vowels, just as v. and y. are sometimes made to serve with ourselves.

The short vowels of the Arabic alphabet are noted by orthographic marks, three in number, which represent, respectively, the sound which in the native alphabet I have given as á,—that of e. or i., and that of o. or u. But these orthographic signs are hardly ever written, so that it is impossible to tell which of the vowels is to be expressed. I shall represent all of them by the vowel a short, having the true sound as pronounced by the natives of the Archipelago as is done in dictionaries in the oriental character.

There still remains one letter of the Arabic alphabet to be represented, the peculiar guttural vowel called aïn. It is a substantive letter of the alphabet, and, according as the supplementary vowel marks are applied, it is a. e. i. or u. I distinguish it by a grave accent, leaving the sound for the explanatory word. The natives treat it as an ordinary vowel without any attempt at a guttural pronunciation.

The whole of the Roman letters necessary to represent the Arabico-Malayan alphabet will be 40 in number, and as follow a. á. ă. à. b. c̆. d. ·d. e. é. f. g. ·g. h. i. j. k. ·k. k̆. l. ·l. ·l. m. n. ṅ. ñ. o. p. r. s. ṡ. s̆. t. ·t. t̆. u. w. y. z. ·z. It is fortunate, however, that this cum-

brous alphabet will not be very often called into use, for the actual number of Arabic words in the ordinary written language is not very considerable, and to the oral language, in which they are trifling, it has no reference.

A very few examples will show how much better adapted the Roman letters are than the Arabic to the expression of the native sounds of the languages of the Archipelago. The Malay words bawa, to bring, and baü, odour, are in the latter represented by the very same letters. So are bunga a flower, and buang, to throw away, so are arti meaning, and arta, goods, both Sanskrit words, the word bágánda, prince or highness, is written bgnd, that is without any vowel at all, although it contains three.

I conclude with a few examples of the changes which Arabic words undergo in Malayan pronunciation. Kábár, news, becomes kabar, fákár, to think, pikir, sábáb, cause, sabab in Malay and sawab in Javanese, rálá leave or permission, lila, and wakt, time, waktu, fáluli, to meddle, paduli. The more the language abounds in vowels the greater the havoc committed. Májád, a mosk, become in Bugis, masigi, sálám, peace, solon, bárkát, a blessing, baraka, and kártás paper, karotusa. The Arabic word wákt time, had been pretty well mutilated by the Malays and Javanese when they reduced it to waktu, but the Bugis thoroughly disfigure it when they make it watüe.

AN ESSAY ON CORAL REEFS AS THE CAUSE OF BLÁKÁN MÁTÍ FEVER, AND OF THE FEVERS IN VARIOUS PARTS OF THE EAST.

By Robert Little, Esq. Surgeon,

Late Demonstrator of Anatomy at the Argyle Square School of Medicine, Edinburgh, &c.

PART II.

ON CORAL REEFS AS A CAUSE OF THE FEVER OF THE ISLANDS NEAR SINGAPORE.

In the first part of this paper a general description has been given of the topography of Singapore, and certain conclusions arrived at; amongst others, that Singapore island is favoured with a climate at once pleasant and salubrious, where the sun never scorches, nor the rain ever deluges, where the temperature is equal, high, though not intense, never varying one month with another more than one degree, subject to very slight diurnal vicissitudes, never rising above 87° 4', nor falling below 74° 7'. Like all tropical regions the atmosphere holds much moisture in solution, which easily falls on the slightest changes in the electric condition or temperature of the atmosphere, giving us an yearly average of 180 rainy days, and a fall of 91 inches of rain. The winds we have seen to be most surprisingly regular, the north east monsoon blowing one-half of the year, and the south west monsoon the other half. In addition to these regular general winds, we have the local land and sea breezes. By all of these, the atmosphere is kept in continual motion, through which, with the quantity of moisture in solution, the sun's rays are so tempered in their effects that little inconvenience is felt from exposure to them; so unlike India in that respect, is this favoured island.

The geological formation of the island conduces to the health of the inhabitants; for by the numerous small rivers, all extra rain is carried to the ocean as soon as it falls. The surface soil is light and porous, and the majority of the marshes being under tidal influence, fevers are not to any extent generated, though a few undrained in-

land marshes of fresh water are still the seats of fever; but the town itself, in which are 30,000 inhabitants, is as free from endemic fever as the most salubrious spot in this wide world's creation. This is attributed by Crawfurd to the free ventilation that exists, but we have shewn that where houses have been built on the sides of hills, a short distance from town and close to fresh water swamps, the freer ventilation of these localities has not saved their inhabitants from fever. Ventilation, when complete, will diminish the intensity of malaria, and when imperfect will increase it; but malaria will never be generated from the imperfection of ventilation. The statistic tables of the Hospitals prove incontestably, that the town is singularly exempt from remittent or intermittent fever of a severe type. In four years not one inmate of the jail died from fever, though 1447 were incarcerated during that time; and in the different hospitals during 4 years, from 1195 cases of fever of different types, only 31 deaths occurred, and these can be traced in almost every instance to cases where the infection had been received in other places, as at Blákáng Mátí, Batavia, and to ship-wrecked crews, who have been received into the hospital while labouring under fever.

In addition, the experience of all the medical men who have practised in Singapore can be adduced in favor of the fact, that from the climate of the town they cannot trace one case of endemic remittent fever. Great must therefore be the astonishment of all, as it was mine, to learn that within 2 miles of the town there is a spot so deadly in its climate, that he who lives there but for a short time, is sure to be cut off with fever. This place is alluded to by Crawfurd as a beautiful and romantic spot which is land-locked, and where fevers and dysentery are sufficiently frequent amongst the Malay settlers, who occupy it. This spot is called New Harbour by Crawfurd, but erroneously, for it is Blákáng Mátí near New Harbour. This Blákáng Mátí is a small island about 2 miles to the west of Singapore town, lying not $\frac{1}{4}$ of a mile from Singapore Island, its length is $2\frac{1}{2}$ miles, and breadth $\frac{3}{4}$ of a mile, and it contains about 400 square acres. It is completely cleared of jungle. It may be said to be of an irregular triangular shape, having 3 hills, and betwixt each a valley. The highest hill is called Bukit Serápong (Flag Staff hill), the others have no names. Betwixt the first and second hill is a valley and a river with an arm of the sea entering for some distance into the land. There are 3 villages, Blákáng

Mátí, Serápong, and Ayer Bándérá. The inhabitants are of 3 classes, Bugis who inhabit Blákáng Mátí and Ayer Bándérá, and detached houses on the hill; Malays who inhabit Serápong; and a few Chinese in Blákáng Máti. The Island is skirted by mangroves, and covered with pineapples and fruit trees, principally Jack, Chumpadak, and Guava.

Let the reader now turn to chart No. 1. fig. a, on Blákáng Máti, and he will observe that kámpong Ayer Bándérá, is situated at the foot of Bukit Serápong, which is about 308 feet in height, and rises rather precipitously on the east. It was used as a signal station for vessels until two years ago, when the signal staff was removed to the Island of Singapore, on account of the unhealthiness of the former station. The hill is almost conical and covered with pine-apples, and a few fruit trees. At its base, where the convicts and superintendents of the signals resided at night, and where at one time about 60 Bugis were located, there is an irregular flat about 200 yards in length; on one side bounded by the hill, on the other by the beach, at each extremity about 20 yards in depth from the beach to the hill, and in the centre about 80. During my residence in Singapore, now 8 years, this locality has been considered eminently unhealthy, and various reports have reached those living in the town, of the numerous deaths in its scanty population. But as only natives were attacked and died, Europeans not living there, but little attention was paid to the remarkable fact, that so near to one of the healthiest stations in India where remittent fever was not known, there should be an island where remittent fever was endemic to such an extent that every one who resided there, however short the time, was attacked, and so severe in its type, that nearly all who were attacked died. Of the 3 men, and a superintendent who were attached to the Flag Staff, three fourths regularly died off; but as these men were only convicts, they continued to be regularly sacrificed to the carelessness of those who ought to have examined into such wholesale manslaughter, nor perhaps, would these disastrous facts have been noticed, if it had not come at last to this state, that they could not get men to live there. Then, but not till then, was the flag staff removed. To shew that I have not exaggerated aught, I beg to give the following extract from a letter of the Resident Councillor at Singapore, to the Governor, dated 27th. January 1845 No. 109. Para. 2d. "(at Blákán Mátí) of late the casual-"ties have been quite appaling, Shaik Cassim who was employed

" as a peon at Blákán Máti, died in June last after a months resi-
" dence. He was succeeded by Hingon who died in August; his suc-
" cessor Cadoo Mera died in September, and again Bera Gajee died
" in November, the latter individual had for several years been em-
" ployed in the Arsenal, and recently discharged consequent on the
" transfer of the ordinance department to Fort St. George. The
" climate appears to be of that baneful character as to prove fatal
" to Europeans as well as natives." The climate, as this extract says, is as pernicious to Europeans as to the natives, for, on consulting my notes, I find the following taken from the victim himself. Mr Spicer while at Lombok in 1835 had the fever of that place, a pure remittent, which returned upon him several times, but he considered himself at last quite relieved of it, when in November 1842 he was appointed to the signal station at Blákáng Máti. He had been there 14 days only, when he was attacked with the fever, which lasted one month, and under which he nearly succumbed. A sailor who was with him, was similarly attacked, and died. During the time of Mr. Spicer's stay on the island, he slept at the bottom of the hill.

Having in common with others heard of the uncommon fatality amongst the natives and strangers, who sojourned there for a limited time, I made many inquiries of the medical men who had been resident in Singapore for a longer time than I had, but, saving the fact of its being very unhealthy, they could not furnish me with any information. I had on several occasions visited the island, but as my object was amusement, I took no heed of the place. But the extraordinary circumstance of having such a fatal spot so near to Singapore town, kept possession of my mind, and determined me at last to investigate the place to ascertain the cause of the fever.

Before proceeding in this investigation, I will briefly describe in a note, to which I beg the attention of the reader, the two forms of fever that are met with in this locality, and which are identical, in all particulars, with the same forms in other places, as the west coast of Sumatra, Batavia, Dilli, Lombock, &c., only differing in intensity and the idiosyncracy of the patients.*

* Batavia fever, West Coast of Sumatra fever, Jungle fever, Remittent fever and *Dimam Kapièlu* of the Malays are all synonymous. The symptoms may be said to be, at first, slight headache, occasional rigors, pain in the small of the back and thighs, restlessness, skin of hands and feet dry, tongue generally dry and brown in the centre, slight thirst, fever felt principally at night, but not severe, loss of appetite, flatulent abdomen,

The reader having perused the note will now be able to follow me in my investigations on the fever of Blákáng Mátí. On June

much distended, skin of the body dry. hot and rough, countenance anxious, eye sunken, and often as if glazed. The patient seldom complains, generally when asked how he is, says "pretty well," but when pressed, complains of great prostration of strength, and shews great apathy as to his fate. These symptoms increase in force, the headache is constant, at night there is often delerium and shortness of breathing, the tongue becomes dry and covered with a thick dark crust, the lips are dry, articulation from the latter causes is not distinct, the countenance shews more of the peculiar anxious cast. The eye is more sunk and has lost all its brightness, complete prostration of strength exists, the pulse is small, quick and compressible, varying from 110 to 120. The skin is dry and rough, sometimes it becomes yellow, vomiting occasionally occurs, diarrhœa is as often present as costiveness. The patient can be roused by a question asked in a loud voice and if that is, how do you feel? "better," may be the answer. Do you feel any pain? "No" is generally returned. This state continues, when the patient may be noticed to breathe a little heavily, a slight convulsive motion is observed in the limbs, and presently all is quiet, the soul having returned to Him who gave it. The principal symptoms are; immediate and excessive prostration of strength, an anxious countenance, great restlessness, dry tongue, very slight remission of fever, which is generally at its height at night; with a want of acute symptoms, and an apathy as to his fate on the part of the patient. If any organ is more affected than another, it is the head, hence the Malay name for the disease is *Dimam Kapièlu*, derived from *dimam* fever and Kápálá the head, but all the post mortem investigations that I have witnessed never disclosed any organ in particular so much affected in appearance as to be considered the cause of death. The duration of the disease is seldom more than 9 days, it may be extended to 21, but generally 7 to 9 days may be said to be the mean of its duration in fatal cases; relapses are of frequent occurrence, complete remission from all fever is seldom to be looked for, as in one-half of the recoveries it passes into intermittent fever before complete restitution to health takes place. The mortality in the hospitals here was in 4 years 23 in 79 cases, a $3\frac{4}{10}$ of those attacked. This is a favorable return, from the circunstance that in this fever the longer the duration of the disease the better is the prognosis, and the majority of the patients in the Hospitals having been attacked previous to their arrival in Singapore, had outlived the most dangerous epoch of the complaint. The disease is never sensibly developed immediately on the malaria having taken effect on the constitutiou of the patient, from 3 to 21 days may elapse, generally 7 to 10. Ships from Batavia in the favorable monsoon have, to all appearance, left with a healthy crew, and not till they had anchored in the Singapore roads has the fever broken out amongst the crew. The other day a brig left Batavia with her men to appearance quite well; 10 days after, the Carpenter was taken ill on a Wednesday. I saw him on the Wednesday following, for the first time, and found him suffering under Java fever, but not in my opinion of a severe type I ordered him Quinnine with wine, to be given every 3 hours; but from some cause or another, on the part of those on board, the medicine was not administered, and when I saw him on the morning after, he was much worse, only having sufficient vitality to swallow some brandy and Quinine, when he expired. In the contrary monsoon vessels from Java have the crews attacked on the voyage, which generally lasts 21 to 30 days. Great mortality of course occurs, from which cause many vessels have been wrecked. Four or

the 1st. and 6th. 1847, in company with Mr. J. R. Logan, I visited Blákáng Mátí for the purpose of investigating the causes of fever there. We landed in the bay marked A, called by the natives Ayer Bándérá. The hill, the most prominent object on landing, is composed of an iron clay stone, masses of which have rolled down, and lie upon the beach. The soil of the flat below is the same with the hill. During the rains close to the foot of the hill a little fresh water may collect, but not to such a degree as to entitle it to the name of a marsh, and that has been of late years drained; indeed the whole extent of the flat, 200 yards long, 80 deep in the centre and 20 at each extremity, precludes the possibility of such a small extent of ground causing anything like the fever endemic there. No jungle covers this spot, and with the exception of a few cocoanut trees and jacks the only living plants are the Hypomia Percapria, Stachytarphita Indica, Beyopbryllum Callycinum, a species of Pterocarpus, a plant of the genus Lenecio, a bulbous orchide, and in abundance the Maloertoma Malabrithica, and a species of Cyperaceæ, with the Myrtys lomentosa. Within a stones throw almost, is the island of Pulo Brání, and yet a little further is Singapore. At each extremity of this low ground, the beach is as it were extended into two horns which are covered with mangrove trees, and give it a half moon appearance.

At this time the signal staff establishment had been removed, and only a few inhabitants remained, natives of the Celebes and known

five years ago an English vessel would have been lost, if succour had not been given, ¾ of the crew having died, or were laid up from this fever. As a general rule however I have noticed that as the intensity of the malaria, (shewn by the degree of fever) so is the shortness of the interval that elapses ere the disease is developed. Another conclusion which I should say is established (as far as my experience enables me to judge,) is, that this fever is not in the slightest degree contagious. What it may be when it becomes epidemic in other localities, where it is endemic, I cannot pretend to say.

Intermittent fever, or *Dimam Kora* of the Malays, from *Dimam*, fever and *Kora* the spleen, requires no description of its symptoms. It seems to be produced from the same causes as remittent fever, and these causes are principally malarious. Whether intermittent fever can be produced from mere vicissitudes of weather in a previously healthy body, without the intervention of malarious influence, is, I consider, still an open question. The same marsh I have seen give rise to intermittent fever in one person, and remittent in another. I have often seen remittent fever ending in intermittent. Medical writers have testified that remittent fever may have originally commenced with intermittent. I can believe it, but have not seen it. The prognosis of this type of fever is very favorable in Singapore. In 967 cases of intermittent fever entered in the various Hospitals in Singapore in 4 years, 12 deaths only occurred.

as the Orang Bugis of Wadju. In one house we found two men and two women afflicted with fever of a remittent type, merging into intermittent, 3 children were subject to intermittent fever, (Dimam Kora) although at the moment I was there they were not labouring under a paroxysm. The only inmates of the house who were unafflicted were 2 children under two years old. In another house, also inhabited by Bugis, were 3 men, 3 women, and 3 children, all had a most sickly appearance, and in spite of the good features and fine eyes of the women, they looked gastly; all have had intermittent fever, and one child died lately of remittent fever (Dimam Kapíèlu) after 14 days sickness. In this house as well as the other, all the inmates, men, women, and children, except the two just mentioned, had enlarged spleens. Close to this house is a sandy promontory which forms one of the horns of the bay, extending into the sea to the distance of 80 yards from the beach and covered with mangroves. On this spot some time ago 18 Chinamen lived, occupied in collecting and burning coral, which abounds on each side. Of these 18, the Bugis told us 12 had died of the fever and the rest had left for Singapore in fear and horror. In June 1847, 4 houses remained tenanted where there had been 10 to 12; while in May 1848 of the four only two remained. The remains of houses are still pointed out by the inhabitants that are left, while they can distinctly enumerate how many of their friends were cut off in this year and that. In other island during the course of my enquiries amongst the natives concerning fever, the frequent answer was, "if you want to find that, go to Blákáng Mátí," which seems to have been one of the first places where the Bugis settled, being near New Harbour, the original settlement of the Malays on Singapore. In all the other islands amongst the Bugis, every family can tell of one or two of its members, who have left their bones on that fatal spot. Its very name betrays its character, a village on the other side of the hill being called Blákáng Mátí, on account of its being situated, *behind the place of the dead.* In contrasting the living with the dead, the latter have a fearful preponderance, $\frac{3}{4}$ of those who have lived there have there died of fever, and not one has escaped the fiery ordeal, though some have passed through it, scathed and impaired for ever. In fact, on contrasting this small spot of ground with all the other localities that I have heard, or read, or seen, to it must be conceded the awful superiority of having in a smaller extent of territory an endemic fever,

of greater virulence, and more fatal in its results, than that of any recorded spot.

Having shewn the singular unhealthiness of this locality, my next object will be to point out the cause, or causes, of such unhealthiness. The reader must bear in mind the locality, that it is a flat piece of ground about 200 yards in length, 20 yards in depth, at each extremity, and 80 in the centre, that a hill of 308 feet rises abruptly behind, while in front there is the beach and a low shelving coral reef, on the southern extremity of the small bay there is a promontory of sand, partially covered with mangrove trees. The height and abruptness of the hill and the proximity of the houses to its base, prevent the south west monsoon from being felt by the inhabitants; the same causes also prevent any malarious influence being brought from the greater part of the island, which lies under the influence of the south west monsoon. The winds during the N.W. monsoon are those only, that can from a distance bring any malarious influence, and they blow over the sea, Singapore island, and the island of Pulo Brání. Singapore island is most healthy, and therefore from it nothing of a malarious nature can be obtained. The island of Pulo Brání of small size is composed of dry iron clay stone with deep water close to the beach in the greater part of its circumference, and is without a foot of fresh water marsh, and little or no mangrove, besides the inhabitants are comparatively healthy, occasionally subject to epidemic fever, but decidedly having no endemic, (the reason of this epidemic will be explained hereafter.) This fever locality being land-locked and prevented from receiving exterior influences towards the S.W. and nothing presenting itself in appearance in the N.E. to account for the disease, the locality itself must be searched for a cause. Its inhabitants differ in no respect from those of other islands, they are as I have said, Bugis and of that tribe known as the Bugis of Wadju.* They are

* As a race they are much superior to the Malays, their features are regular and open, their face more inclined to an oval, their eyes are large and dark, their nose more elevated. The women have generally oval faces, noses inclined to a Grecian mould. The alae by no means separated, and distended as with the Malays. Their eyes are large, dark, and lustrous; their expressions are soft, and gentle; and their figures are in many instances perfect, even to a critical eye. One great blemish, is however invariably seen, which to the lover of European beauty, would destroy every other charm, and that is their teeth, which, when the females arrive at the age of womanhood, are filed close to the gums, and the small part of the crown of the tooth that remains is constantly kept in a reddish-black state by chewing the siri, betel and chunam &c. The women have seldom more than

well to do in the world, compared to similar classes of natives; their wages or profits being greater, their food better, and their houses and clothing superior to the natives amongst whom they live. In the first part of this paper, I have stated my belief that the consequences of extreme poverty powerfully induce those subject to it, to receive malarious impressions. In this locality, as poverty cannot be said to exist amongst its inhabitants to such an extent as to aid in the developement of fever, it cannot therefore be considered as the cause of the disease, supposing I allowed poverty and its concomitant evils to be one of the causes of fever, which I do not. As no causes exist, as far as we can see, external to the locality, to engender this fever, and as the physical comforts of the natives are equal if not superior to the same classes inhabiting other islands as Pulo Sikrá, Pulo Sikejáng, islands of known salubrity, the field of causation is reduced to very narrow limits indeed. The first idea that occurred to me as likely to be the cause of the fever,

3 to 5 children, all of whom they rarely rear; they have a singular custom of suckling all their children one after another, so that a Bugis mother is never relieved from the duties of a nurse. I have seen a baby of 12 months, a child of two years, and another of 4 suckling from the same mother, one after another. In habits they are very gregarious. Where there are families, two or three generally live in one house; where there are old, or young men, 3 or 4 generally do the same Their houses are built in the Malay fashion on posts elevated 5 or 6 feet above the ground. The roof is made with attaps of the Nipa Palm, which also form the sides. The floor is generally composed of slips of Nibong, or the wild Pinang tree laid loosely on, through the interstices of which all the water and filth fall into the space below, which is generally enclosed so as to form a store room, and poultry yard. The occupation of the Bugis near Singapore is generally a combination of pine-apple planters and fishermen. Wherever one of that nation places his house, he plants cocoanuts, and some other fruit trees. From their pine-apples which grow in abundance, and which are sold on an average at the rate of 3 to 400 per dollar, and from the fish which they sell at the neighbouring market of Singapore, the Bugis settlers can live well, and clothe themselves well, their receipts generally averaging one third more than the average wages of Singapore. The women contribute their mite, and not a small one, to the general profits. Their cloths, called *Sarongs*, woven of gold and silk, are raiments for princes, while their coaser articles of manufacture are celebrated for their durability. In religion they are Islamites, which denies them the use of wines and spirits, but they make up for it, by a drink made from the pulp of the pine-apple by allowing it to ferment. This liquid must be drunk in the first stage of fermentation or it becomes very soon acid; it is pleasant and exhilarating, but it seems to have a strong purgative property, as they invariably steep in it some of the bark of the *Poco Nerei*, a tree generally found amongst mangroves, which counteracts the tendency to Diarrhœa. Jollifications from the indulgence of this fermented juice of the pine apple are not of frequent occurence, only happening when friends long separated meet again, or on great festival days, the juice never being kept prepared in the house.

was the existence of a fresh water marsh; but no swamp of that description exists, except what a heavy shower of rain might occasionally form, with the decomposition of a few graminaceæ and cyperaceæ that grow on the soil, but to suppose that could be the cause of this formidable endemic, would be the same as to imagine that a bucket of water spilt in front of a house could create a dangerous sickness amongst its inmates. But in other parts of the island there are marshes, and fresh water marshes too, but these are so placed, that if they were the cause of the fever in this Ayer Bándérá, the sickly season would be in the S.W. monsoon and not in the N.E. which is the sickly season, as the winds during the N.E. monsoon do not blow over the marshy part of the island. In addition the Flag Staff hill forms an effectual barrier. But to remove all doubts, I, on several occasions, visited these wet localities, for marshy they can scarcely be called. On the first of June with Mr. L. I crossed to a village called Serapong, about $\frac{3}{4}$ of a mile from the fever locality, but separated by the slope of the hill and mangrove trees. The inhabitants of the village are Malays, and are in number about 50. The houses are built on the gentle slope of a hill near its base, at the foot of the hill a lively clear stream of fresh water is seen flowing gently to the neighbouring creek, into which it empties itself. To the south of this village a part of the ground is rather flat, and contains many fresh water springs. This, in the wet season, forms the only marshy ground on the island, but which in its whole extent cannot be more than 10 to 20 acres. If any were to suffer from this marsh, it would be the people of this village of Serapong, but attend to what they say. They have had a few cases of fever occuring amongst them, principally Dímam Kora, or intermittent fever, at present two are so afflicted, one of whom, a child, I examined and found the spleen a little enlarged. They have had cases of Dímam Kapíélu, which runs into Kora, but not for years, *never had a death from fever*, all the inhabitants have a vigorous healthy look, a great contrast to the yellow wretched and sickly countenances of those living near the Flag Staff station. In April 1848, about 9 months after my first visit, I found that the villagers had lately been suffering from intermittent fever, owing to the almost unprecedented wet season, but no Dímam Kapíélu, or remittent fever, had carried off one victim. Here then is marshy ground which during or after a wet season produces fever of an intermittent type, and in a few instances of a remittent, running into intermittent, but

which, in the memory of the oldest inhabitant in the village, has not occasioned one death. Would I therefore be authorised in concluding that it is the cause of a fever endemic $\frac{3}{4}$ of a mile distant, of so deadly a character as to carry off $\frac{3}{4}$th of those attacked, and change a pleasant, and to the eye a salubrious spot into a perfect charnel house, and that in spite of the aforesaid distance, and a hill which prevents all breezes which pass on the one, impinging on the other. Fully conceding the malarious character of fresh water marshes, which I have shewn to be sure and consistent generators of fever, the existence of this limited marsh would never account for the deadly character of Blákáng Mátí fever, and never could be offered as an explanation of the causes of that fever, from the impossibilities which exist to its influence extending so far. The only, and last explanation, that has been offered to account for the generation of this fever is, *the decomposition of the pineapples*, which are grown in great abundance on this island. This explanation has been given as the cause of this fever in an official report by one of the Honorable Company's medical officers, and as it is an opinion held by many others, it is therefore deserving of investigation. The island of Blákáng Mátí is one vast pinery, supplying the market of Singapore with this delightful and refreshing fruit; when ripe it passes soon into fermentation and emits a sharp, acid, and most unpleasant odour, creating a sensation of disgust and nausea, too frequently felt in Singapore town, from the great want of entire cleanliness. This has evidently originated the idea, that, if the refuse of a few can create such a nuisance, an island like Blákáng Máti must certainly be unhealthy, where at least 200 acres are covered with the fruit. But on examining the island I found another instance of how plausible a theory may be, but when subjected to examination, how flimsy and faulty it may become.

In the first place no decomposition like to what occurs in Singapore streets exists on the Island, as the natives cut the pines invariably before they are quite ripe, and those that are ripe, and unnoticed by the cultivators, are food for the wild pigs that abound on the island. The leaves and stalk are most difficult of decomposition as I have seen from experience, having on a small piece of ground a number of wild pineapple plants, which I have been under the necessity of burning, as I find it almost impossible to get them to decompose sufficiently fast. In walking over the island amidst thousands of pineapples, you will notice very little vegetable mould, and

no vegetable matter in that stage of decomposition which a habitual observer of marshes knows to be capable of generating malaria; neither is there any odour of decomposition, but every thing is dry and to the senses salubrious. This assertion of mine in contradiction to that of good and grave authorities, is borne out by facts. The village of Serápong, which we have had under examination, is situated as it were betwixt two hills, on the slopes of which nothing else but pineapples grow, and the fever, as we have shewn, is not endemic in that village. On the 6th of June, 1847, after examining the locality of Ayer Bánderá, where the fever is endemic, we ascended the hill to the height of about 46 to 50 feet and came to a house about 60 yards from the mangrove swamp and about $\frac{1}{4}$ of a mile from the place where we started. In this house were 2 men, 2 women, and 2 children, who had been sick, but were now quite well; their appearance was not unhealthy. After skirting the hill for a short distance, we descended into a valley, in which were 3 houses, partially open to the sea, but shut out to a great extent by mangrove trees; in one house were 13 people, an old man was sick and had been so for 10 years, but not with fever; in the 2 other houses were 3 or 4 persons who were quite well. These houses were surrounded by pineapples, and though situated in a valley, yet was it so narrow as to act as a drain, and carry off immediately to the sea all the rain that fell. From this we ascended to the hill through pineapples and champada trees, and so crossed to the other side of the island. Before rounding the hill we came to a house inhabited by 3 old people, who were quite well and had never been sick; they were surrounded on all sides with pineapples On rounding the hill we came to another house with the sea in front and below. The old man who lived there had lost in 30 years eleven of his friends in this house, and he alone of all his family lived to tell the tale. This must strike the reader as remarkable, as it did us, that where the houses were land locked, no fever shewed itself, but no sooner did we reach one that was exposed to the influence of the sea, than we found fever to be prevalent on that spot. In other parts of this Island where the Bugis cultivate the pines and place their houses at a distance from the sea, or better still interpose a hill, or cluster of trees, we invariably found them free from fever. In April 1848 I visited the only remaining unexamined house in the island in company with Mr. Lobb, and found in it 5 men who had lived there 3 years, without an attack of fever. One had enlarged spleen, but

this he said was of an old date, and this house was surrounded by pineapples. From the island of Blákáng Máti we proceeded to a neighbouring one called Pulo Sikejáng, ascended the hill through pineapples, found one house with one inhabitant; he had no fever and never had any. After walking $\frac{1}{4}$ of a mile through pineapples, we made a precipitous descent, and reached the bottom of a rich and narrow valley, in which near the sea were 2 houses and 5 inhabitants; all were well at present, but one had about a year ago an attack of intermittent fever, but no remittent cases had ever appeared among them. The next island is situated about 12 miles from Singapore town and about $1\frac{1}{2}$ miles from the western extremity of the island of Singapore. It is called Pulo Pisee, there is one abode inhabited by six Chinaman, who are charcoal burners, all appeared healthy and they declared they never had fever, though the island is covered in every direction, even to the water's edge, with pineapples.

Near to this island is one called Sikrá not much inferior in size to Blákáng Mátí, and covered entirely with pine-apples. Surrounding the island is a belt of mangroves, but no other tree is to be found on the island, saving a few fruit trees. These are scattered in various parts of the island, near to 6 houses inhabited by Bugis, who are from 30 to 40 in number. I made there a most minute examination, and the result was that not one had contracted fever while on the island, and some had lived there for 20 years, others formerly lived in Blákáng Mátí, and while these contracted fever but lost it after a short residence on this island. I might multiply such proofs of the innocuous nature of pine-apple plantations, until the subject became tiresome, but enough of evidence has I think been produced to shew that the fever on the island of Blákáng Mátí, cannot be said to arise from the decomposition of the pine-apple: and now we have exhausted the supposed causes, and shewed that none of them can account for the fever, nor for any fever; in short I may say that we have brought forward all the causes that land can produce, and in my humble opinion, have proved that not one of the causes is competent to account for the appaling mortality which results from the endemic fever of that spot of the island of Blákáng Mátí called Ayer Bándérá. It now remains for me to explain my theory, which is the subject of this essay, and which, to the best of my belief, is original. At least I am ignorant that it has ever been broached. I have examined all the medical works and periodicals

which I have access to, including the able B. and F. Medical Review from its commencement to its termination, and cannot find that Coral Reefs have ever been hinted at, as a cause of fever. I have therefore been most anxious to obtain sufficient proofs, before giving it to the public, for well I know that my profession is a jealous one of aught that is new, and views with suspicion what has been overlooked, and is for the first time brought to notice. It is now more than twelve months, since I was convinced of the truth of my theory, and during these past twelve months, I have not concealed my ideas; but to every medical man with whom I have come in contact, I have stated them and given my proof, begging him to furnish me if he could with any additional testimony or refutations. I have especially directed the attention of the medical officers of Her Majesty's Navy to the subject, as it is one of importance, especially to those who visit Borneo, as I am convinced many valuable lives would have been saved on board H. M. Ships "Agincourt," "Iris," and "Columbine", if this theory had been known, and advantage taken of that knowledge in the selection of proper stations.

On landing at Ayer Bándérá on the island of Blákáng Mátí on the 1st of June, 1847, with Mr. Logan, it so happened that it was low water, and as we stepped from the boat on shore, we could not but remark what an extensive coral reef was before us, and as we walked on it my attention was attracted to the delicate live coral which we crushed below our feet, and to the Zoophytes which covered other masses of coral, or over whose slimy surface we stept. Having reached the sandy beach I turned to look at the extent of the reef, and my sense of smell was assailed with a most disagreeable odour, when the thought struck me that as every inch of the mass before me was composed of living matter, peculiarly susceptible of decomposition, why should this not be the cause of the fever which attacked the inhabitants of the houses to leeward of it? I examined all the natives of the houses, and found them, as I have written, troubled with fever. I examined all the locality, and the other parts of the island, but, as I have shewn, without being able to find a satisfactory cause, and the causes that had been broached by other medical men, I found to have no effect in producing the awful mortality already described. I therefore came to the conclusion, from many reasons that rose up to me, as proofs, one after another, that *wherever coral Reefs are exposed, fever, especially remittent fever, (Dímám Kúpiélu,) will be endemic on that spot* "*Cæteris paribus.*"

In front of the village of Ayer Bándárá, Blákáng Mátí, are two reefs, one attached, as a fringing reef, to Pulo Bráni, and the other to Blákáng Mátí; betwixt them is a deep channel of from five to eight fathoms in the centre, though close to the coral it is of very little less depth, so little, that you can from a dry coral reef, step into 4 fathoms, in the next step. The Reef attached to Blákáng Mátí, whose influence is felt by those living in Ayer Bándérá, is of a triangular shape, the sides of the triangle not being less than $\frac{1}{2}$ a mile. The reef attached to Pulo Bráni is about $\frac{3}{8}$th of a mile long, but of no great breadth; at low water, spring tides, the whole of these reefs are uncovered, so that by lying on the reef, one can look down into a depth of from 4 to 9 fathoms, like as a school boy does on a wall and looks at the objects below, which here are living corals of many and wondrous shapes, with tints so beautiful that nothing on earth can equal them. While the lovely coral fish, vyeing with their abodes in the liveliness of their colors, are to be seen peeping out of every crevice, on the reef, which at full tide has but a few feet of water to cover it, and is exposed at low water, are to be seen nothing but dead masses of coral with living ones of a different species fringing them, and here and there in spite of the sand, a few shoots of the branching madrepores, and a few detached madrepora fungia. This paper will not allow me to detail all the varieties of coral there to be met with, sufficient for us is the fact, that while all in deep water and in the shelving dyke seems to be living coral, what is exposed on the reef is about $\frac{1}{3}$rd living, or rather has been lately living, but is now in the progress of decaying. The researches of many naturalists prove, that from immense depths, the coral has the tendency to grow upwards, but when it reaches that height, which exposes it to the atmosphere, and uncovers it at low tides, it dies, the part breaks off, is swept on shore and there it remains until its animal particles have changed their manner of existence, and the earthly passes into detritus to form a sandy beach. Some corals, as a species of Porites, seem to live where they are subject to partial exposure for a few days, but all naturalists and practical men are of opinion that generally partial exposure to the sun kills the Zoophytes, that inhabit the cells of the coral; sand and mud and detritus brought from the shore, or formed from the dead coral, will also kill the living coral. Fresh water seems to act as a posion to all the Coralline Polips, for no coral is ever deposited where a river pours its contents into the sea, hence Darwin accounts for the chan-

nels in the Barrier reefs and Ehrenberg shews from microscopical observations that the beds of rivers are principally formed from the silicious remains of infusoria killed by the advent of fresh water and which the currents retain at the mouth of the rivers.

Mr. Leisk who has lived for years in the Cocos Islands, and who is mentioned by Darwin as affording him much information, tells me, that when the living coral in the sides of the Lagoon was exposed to the atmosphere by the force of a peculiarly strong trade wind, driving back the sea, and rain having fallen at that time, it immediately died and blackened, and gave forth such a stench as to be intolerable, while the fish that were in the lagoon rose dead to the surface, poisoned by the decomposing polyps. This effect of rain on exposed coral reefs I have seen again, and again, and even the natives have noticed that after a shower of rain, a coral reef always emits a greater stench. Besides this decomposing living coral, myriads of animals are to be noticed of the class of Zoophytes, soft sponges, Echinæ of various shapes and sizes, some even gigantic, the length between each angle of the pentagon in one kind being near 8 inches, as I have measured, all are incessantly in condition of being produced and dying, and from all this decomposing matter, of $\frac{1}{2}$ square mile in extent, I say you have the Malaria produced which generates the fever endemic on this part of Blákáng Mátí.

Nothing of an animal nature on the face of the earth exists to equal this coralline source of malaria in extent. Fresh water marshes, though of greater magnitude do not proportionally generate such virulent malaria, and if this source of miasm from coral was not confined in its operations to a few hours in the day, when the tide is at its ebb, the localities possessed of such reefs would be more fatal than the fabulous valley of death, where the birds were wont to drop down dead as they flew over the spot. This being in a continual state of decomposition, will, according to the theory I have advocated in the introductory essay, be a source of malaria and also be the cause of fever. That decomposing animal matter will create fever I need scarcely say is an opinion universally believed in, so much so, that I will content myself with quoting a few passages from Copeland's Dict: of Medicine p. 569.* Such being the con-

* "When dead animal matters, or exuvial mix with vegetable substances, and putrify along with them in a warm and moist air, the effluvium assumes a more noxious form, especially if the air stagnates, in the vicini-

centrated opinions of many eminent men, sufficient has been shewn to warrant the following deductions.

1*st. That living Coral when exposed to the atmosphere, or fresh water, or when covered with detritus, dies. 2nd. That an effluvium passes from the said exposed coral, which, like all effluvia*

ty of its sources. In warm countries, the localities enumerated above abound with dead animal bodies, and the exuviae of immense swarms of insects; and hence may be inferred the reason wherefore terrestrial emanations in these climates give rise to more severe forms of intermittent and remittent fever, depress more remarkably the vital powers, derange more the vascular system, and more sensibly affect the blood and secretions, than the miasmata inhaled in similar places in northern latitudes." p. 771 "The *Putrifaction of Animal Substances* has been supposed by many to occasion disease in those who come within the sphere of the exhalations thus produced and even to generate a malady which has become infectious, and has partly thereby, and partly from other concurring causes, prevailed to an epidemic, or even pestilential extent. It is not however dead animal bodies, or considerable collections of putrid matter, but also heaps of *filth exposed in the streets, animal excretions,* and exuviae subjected to a warm and stagnant air, and neglect of domestic and personal cleanliness, that are thus injurious. Theselatter may be less energetic agents than the foregoing, but they more frequently exist, and are more common concurrent causes. The injurious effects however of putrifying animal substances have been denied by Dr. Bancroft and others, by a species of argumentation more specious than solid, by a kind of medical special pleading, of which we have had more, since the commencement of this century, than is consistent either with facts, or with the advanced state of general science. Animal substances in a state of decay will produce effects, varying with the temperature and humidity of the air, with the concentration of the exhalations proceeding therefrom, and with the state of individuals, or of the community exposed to them. A candid appreciation of the facts which have occurred to most experienced observers, in connection with those recorded by creditable writers, will I believe warrant the following inferences:

1st. That in low ranges of temperature the exhalations from putrid animal substances will seldom be productive of marked effects, unless they accumulate or become concentrated in a stagnant atmosphere, unless they be assisted by imperfect ventilation.

2nd. That the combination of those exhalations, with those emitted by decayed vegetable matter, and by deep absorbent soils, gives rise to effects of greater severity than those occasioned by either operating separately; and that the intensity of these effects will depend upon the temperature, humidity and stillness of the air, and other concurrent circumstances.

3rd. That *emanations from dead animal matter* in the various states in which it is met with, are capable of causing even of themselves, serious effects, as shewn in the article Dysentery, *and that when aided by high ranges of temperature and humidity,* they are often productive of extensive disease, which usually assumes, especially in a crowded population, and calm atmosphere. infectious properties.

4th. That even when they have not been the chief element or cause of the epidemic constitution, they have been not unfrequently concurring agents."

via or emanations from dead animal matter in a state of decomposition, is eminently unhealthy, cæt: par: 3rd. That in the absence of all other causes, the coral reef in front of Ayer Bándérá is the cause of the endemic remittent, and intermittent fever, that has cut off so many, and still attacks all the residents in the said locality.

On examining more minutely, I found that in the N.E. monsoon, which I have shewn blows during half the year, and which blows over these reefs, there is more unhealthiness than in the other season, while during the S.W. monsoon, whose winds blow over the island, the inhabitants are comparatively healthy. This is from three causes. 1st. from the direction of the wind being directly over the decomposing coral reefs. 2nd. during that monsoon more rainy weather occurs, it being the wet monsoon, the deaths among the living Polyps will therefore be greater than during the dry monsoon, and so furnish more matter for decomposition. 3rd. in the N.E. monsoon the weather is much more changeable and the vicissitudes in the thermometrical and hygrometrical state of the atmosphere much greater than during the S.W. monsoon; for these reasons in any situation, independent of the coral, the climate would be more unhealthy.

Two reasons exist for this Ayer Bándérá being more obnoxious to fever than any other locality near Singapore. The first is: the winds during the N.E. monsoon which waft the poison from the two coral reefs are prevented by the Flag Staff hill from diffusing it, they therefore strike on the abrupt face of the hill and fall in a concentrated state on the devoted heads of those who have their residences betwixt the base of the hill and the beach. During the S.W. monsoon the wind cannot affect the reefs immmediately below the hill, on account of its height: and therefore instead of a wind carrying away the poisonous emanations, and diffusing and so rendering them innocuous by diluting them with the surrounding atmosphere. there is a fatal lull which allows the sea breeze by day to bring to the land the efluvium which would otherwise be diffused. The 2d. cause which renders it obnoxious is the rapid current which runs betwixt Blákáng Mátí and Pulo Brání, sometimes at the rate of 7 miles an hour; opposite to Ayer Bándérá the channel is deep and narrow, but suddenly increases so that in $\frac{4}{8}$ths. of a mile it widens from the $\frac{1}{8}$th to the $\frac{3}{8}$ths. of a mile by which the velocity of the current is much decreased, and detached coral or animal and vegetable matter is thrown on

each side of the rapid current on the coral reefs, by which substances liable to decomposition are increased in quantity.

With these strong proofs in favour of the coral reefs being the cause of fever, I determined to investigate the island and other islands, for if I could find a locality exactly similar to Ayer Bándérá and yet healthy my theory would be much shaken, if not proved to be fallacious. On referring to my notes I find, that, "after examining the last house on Ayer Bándérá on the 1st of June, 1847, we crossed over to the village called Kampong Kopit, (vide chart) nearly directly opposite and separated by a deep channel in the middle, shallow towards the Blákáng Mátí side, but deep on the Pulo Brání side. The distance across is half a mile. The number of houses in this village is about 25, and the inhabitants may number 100, at present there is one case of fever, and one child only of the many that I saw had enlarged spleen. One year ago they said they had fever very bad, 80 people having died of it, but with Malays you cannot depend on the accuracy of their numbers, but I could depend upon my own observations, which were to the effect that all looked healthy and the children had no marks of disease upon them, affording a striking contrast to their neighbours opposite, among whom, at the same time, there were only 2 healthy persons and these were children. They say when they had fever, it was during the S.W. monsoon in the month of June, and that they consider that monsoon their unhealthy one. The village has a deep shelving shore and coral is but little exposed to the air. To that and the distance of half a mile betwixt the village and the edge of the reefs that affect Ayer Bándérá, I was about to attribute the safety of the inhabitants, but on a second visit, 12 months after, I found that the village being built on a neck of the land, the island of Pulo Brání effectually prevents it from suffering from the winds during the N.E. monsoon, which blow over the coral reefs which fringe the S.E. end of the island, and the promontory already mentioned as forming the south horn of the bay of Ayer Bándérá with the Flag Staff hill and a part of Pulo Brání prevent the S.W. wind frombringing the poisonous effluvium from the reef that fringes Blákáng Mátí. Here is an instance, and that only one of many, where the short distance of half a mile intervenes betwixt a locality possessing an endemic fever, and a locality where only an epidemic occasionally occurs, but in that distance there are eminences and trees, which act the part of barriers to the invasion of the malaria, but which malaria when in excess

and more than usually virulent, combined with other causes with which we are unacquainted, sometimes vents its virulence and becomes epidemic, as in the year 1846. This fact is well known to statisticians. Dr. Forbes mentions in his Journal that the plague is always endemic in Upper Egypt, but never becomes epidemic until some extraordinary causes combine, when it spreads and destroys the population of many countries. The same is the case with remittent yellow fever in America, and cholera in India.

Still pursuing our investigations, we returned on the same day to Blákáng Mátí, and by a foot path which skirted a creek and then led us across a small fresh water stream, we reached a village called Serápong, composed of 9 houses and numbering 50 inhabitants. The houses of attaps are built on the slope of the hill, in front there is the Flag Staff hill covered with pine-apples, and which separates the village from the sea and Ayer Bándérá, behind nothing is to be seen but pine-apples. A stream has hollowed out a deep path for itself at the bottom of the valley and leads the fresh water from the marsh which is close to the village, to the creek of the sea, but from which the village is separated by mangroves. The inhabitants are Malays and their settlement is of some age, judging by the numerous Durian trees, under the shade of which the houses are built and the natives dose away their existence; on making minute inquires I found that they are scarcely troubled with fever. At times 2 or 3 persons have slight attacks of Dimam Korá (intermittent fever,) and one child had its spleen enlarged. Their intermittent fever, they say, commences with symptoms of mild remittent, *but they never had one death from fever.* The season when intermittent fever occurs, is in the S.W. monsoon. In April 1848, I again visited this village and found that the inhabitants had lately been very much troubled with intermittent fever and which they attributed to the rain, an excessive quantity having fallen within the last few months; although many persons had suffered from the intermittent fever, none had died of it. From Serápong we crossed the island to a village on the sea beach, properly called Blákáng Mátí, from, as the head of the village told us, "being placed behind the place of the dead," alluding to Ayer Bándérá. This village has a beach of sand, and, still further out, of coral, behind is a mangrove swamp, the houses are 7 in number.

1st. house, 8 people, all have had intermittent fever, and no deaths from fever.

2nd. 1 man, 1 woman and 4 children, all well in the N.E. monsoon, had intermittent fever but no remittent.

3rd., 2 of its inhabitants have had intermittent fever but no remittent.

4th., 2 males, 6 females and 3 children, all well, had formerly intermittent fever but no remittent or deaths from fever.

5th. house contained 8 people, have had intermittent fever, but no remittent or death from fevers.

6th., 8 Chinese, one had remittent fever on arrival which lasted 3 months. The others have neither had remittent fever nor intermittent. This house is close to the beach, and in front of all the others.

7th. house, 8 people, 2 have had intermittent fever, viz., a mother and child, the others have not had remittent or intermittent fever.

In different parts of the island, but away from the sea, we fall in with single houses surrounded by pine-apples and perfectly healthy, except one on the side of a hill which was subject to the full influence of the wind blowing over the reef at Blákáng Mátí. The old Bugis we found living in this house was employed in rearing mouse deer, he was alone in the world, having in 30 years lost 11 of his family and many of them from dimam kapíèlu or remittent fever. After the examination of this island we proceeded to Telloh Blángá, the residence of H. H. the Malay Tamungong, who informed us that at present his village was free from fever, though one year previous i. e. 1846, many had died of it. The beach here is of mud, with here and there small particles of coral, though not exposed. On the 6th. of June, 1847, we examined a village called Pantie Chirmin, about one mile from H. H. the Tamungong's village. This village is built on stakes on the sea, and consists of 6 houses all communicating with one another and containing between 50 to 60 inhabitants, at present there is no sickness, but formerly and frequently the village was almost depopulated with remittent fever (dimam kápíèlu.) Mud and coral surround this village, the latter being exposed at ebb tide. Still pursuing our investigations, we crossed to 2 islands called Pulo Sákijáng about $1\frac{1}{4}$ mile from Blákáng Mátí. On landing on the nearest we ascended a hill covered with pine apples and found one house with one inhabitant, he had resided there for some time, and never had fever. After walking $\frac{1}{4}$ of a mile through pine apples, skirting the hill at the same time, we made a precipitous descent into a narrow valley, but with rich

soil and fruit trees; at the bottom of this valley were 2 houses and 5 inhabitants, all were well at that time, one year ago one had intermittent fever but no remittent. The beach was sand to some extent with a little coral far out. From this island we pulled to the other of the same name, and found on the beach a colony of Bugis, consisting of 7 men and inhabiting 3 houses. This had been a settlement for 40 years, and they permitted no women to be located with them, the only reason they gave for this misogynistic feeling, was that women invariably quarrelled and prevented them from working; one man only had had fever and ague from which he had recovered. Remittent fever had never attacked any. On examination we found the beach was entirely composed of sand and no coral. The sand seemed to be the detritus of the land, and the sea was gaining on the land.

November 21st 1847, visited Pulo Bukam about 5 miles from Singapore, examined a settlement inhabited by Malays. This was situated on the beach with a gentle sloping hill at some distance behind. The number of houses might be 20, and the number of children seemed to be out of all proportion numerous. The Bátín or head man of the village says, this is a healthy locality, occasionally they have an attack of remittent fever, saw one man convalescent from it. During the S.W. monsoon had a few cases of dimam kápíèlu or remittent fever. The beach is composed of sand or mud, but outside that there is exposed coral.

June 1848, visited this settlement again, found all healthy; there is an extensive reef of coral directly in front, but not much exposed except at spring tides, what is exposed is dead and covered with sand. The free ventilation is what saves this settlement, for if the houses had been exposed to an atmosphere as confined as that in Ayer Bándérá, or Blákáng Mátí, of a truth there would have been an endemic here of as great virulence as in the latter place. On skirting the island we came to a Bugis settlement of 7 inhabitants, they had been located here for 3 years, and never had fever. The sea at its ebb leaves a beach of sand, and at spring tides in addition a narrow border of living coral. The winds in the N.E. monsoon are the only ones that can affect them. In another settlement there were 8 houses, also Bugis, some of whom had been located there for 20 years; no fever. At low water a beach is exposed of 150 yards in depth, composed of dead coral, covered completely by sand, but to seaward of that, there is living coral, but the water in the length of

two yards deepens from 3 feet to 2 fathoms and then to 7 ; between the 2 and the 7 fathoms living coral is to be seen in all its luxuriance and beauty, but never exposed at low water. Having finished our observations on Pulo Bookum, we pulled over to Pulo Siking, a small island about 1 mile distant. It is high in the centre and composed of iron clay stone, surrounding it are mangrove trees ; no fresh water swamps are found on the island. Houses are built on the slope of the hill, facing the north, and can only be affected by the winds during the N.E. monsoon, which blow over a coral reef of some extent, not covered with sand, and although there is some detritus, from the island, from the iron clay stone, yet it does not seem to destroy the Polyps of the corals like to what sand does. On this account the reef facing this locality, though not so extensive as around Pulo Bookum, yet contains comparatively more living corals. During the N.E. monsoon the people were unhealthy, 3 out of the few inhabitants were labouring under remittent fever, one of whom died, as I learned on a subsequent visit. During the S.W. monsoon, which blows over the island before reaching the houses, the inhabitants are healthy. To this island (vide chart) I am desirous of directing the attention of the reader. It is about $\frac{1}{2}$ a mile long and $\frac{1}{4}$ of a mile broad, elevated in the centre to the height of 20 to 30 feet above the level of the sea. It has been cleared of jungle and is without a fresh water swamp. Cocoanut and other fruit trees grow on it. Surrounding the island is a narrow belt of mangrove trees whose roots are daily washed with the sea; the soil of the island is entirely Iron-stone-clay, the iron being in the state of of peroxide. The inhabitants occupy 7 houses and are about 30 in number. The houses are well built and superior to those of many other islands on account of the greater industry of the inhabitants in boat building. These houses are built on the slope of the hill facing the sea to the north, behind them is a little high land with rows of fruit trees. Their unhealthy monsoon is the N.E. during which the winds blow over a patch of living coral, and coral in a state of decomposition and not covered with sand. That this is an unhealthy monsoon, is evident from the fact of 3 being ill of remittent fever (dimam kápiêlu), and that of such a severe type as to carry off one ; when I saw the sick I had no hopes of two, so bad were they, yet I recommended their friends to call upon me and get proper medicines, which they never did. In June 1848, I visited this same island and found all healthy ; before reaching the houses the wind in this monsoon blows

over the island must carry to sea the poisonous effluvium of the coral. In May 1848, I started early with Messrs. L. and B., to examine a cluster of islands about 15 miles to the westward of Singapore and which excursion the reader will be able to trace by examining the chart. The first island we reached was Pulo Dámár, so named from rosin trees which once grew on it, and whose gigantic remains now shew how magnificent the primitive jungle was.

This island is of small extent, and contains 10 houses and about 50 people, some of whom have lived there for 20 years, the length of time of the establisment of the colony. The surface soil consists of Iron clay-stone, mangroves surround the island, fruit trees and pine-apples grow on it and coral is to be seen more or less exposed, *except* in front of the houses. *No fever has ever attacked the inhabitants.* From this island we crossed to the mainland, but as I will advert to that in a subsequent part, we will proceed to the next island Pulo Pisí, a small spot of ground covered with pine-apples, with no coral exposed, although surrounded by an extensive reef, inhabited by 6 Chinamen, charcoal-burners, whose healthy looks confirmed their statement that they never had fever. From this we passed to Pulo Sikrá, the largest of the neighbouring islands except Blákáng Mátí. We found it to be an island of no elevation, surrounded by a belt of mangrove trees, the primitive and secondary jungle having been entirely removed, while pine-apples cover the whole extent of the island, with a few fruit trees round the houses of the Bugis settlers, who are from 30 to 40 in number, and inhabit 6 houses, the only habitations on the island. These houses are inland and separated from the sea by a belt of mangroves. A most minute investigation convinced me, as they themselves assured me, that they had no fever, nor ever had any, and that they were not ignorant of what fever is may be inferred from one family contrasting their present healthy condition, to what it was when living on Blákáng Mátí island, when they were all affected with fever and lost many of their relatives.

From this island we pulled to a contiguous one, called Serái, so named from the abundance of trees of that name which once grew upon it. We found the surface soil to be composed of iron-clay-stone, no jungle, but in its place fruit trees. A belt of mangroves surrounds the island except at the bay where we found the kámpong or houses of the inhabitants. The houses were from 8 to 10 in number built on the slope of the hill and faced the N.E. In front fill-

ing the bay is a large patch of living coral, over which the wind in the N.E. monsoon blows, and then over the island. During that time the inhabitants assured us they were *sickly*, many dying from dimam kápièlu (remittent fever) but during the S.W. monsoon which blows first over the island and then over the coral, they were *healthy*, which was their state at the time we visited them.

Having finished the examination of the adjacent islands, the villages on the coast of Singapore now claim our attention. We have already in the first part of this essay glanced at the condition of part of Singapore town, built in the native fashion, inhabited by them, and known as Kámpong Bugís, Kámpong Málácca, Bukit Pássu &c., in all of which we found the inhabitants (in spite of the filth and dirt which surrounded them and the poluted atmosphere which they incessantly breathed) healthy and never subject to endemic fever. This immunity from fever I have shewn is dependent on these localities being subject to tidal influence, by which the impurities, as decomposing vegetable and animal matter, are carried away instead of being allowed to remain to form the germs of malaria; and in addition, what germs are formed, are destroyed, their death being almost simultaneous with their formation, by sulphuretted hydrogen, formed by the decomposition of saline sulphates and organic matter. While such influences save these localities from endemic fever, it does not prevent occasional epidemics from bursting forth, for instance Kámpong Málácca, which is and has been for years entirely free from fever, was 5 years ago afflicted with an epidemic of dimam kapièlu or remittent fever, and 15 years previous to that, my informant was himself attacked with the fever and cured by a decoction of the leaves of the *Picha Píríng*, a species of Gaudinea. When I examined Kámpong Bugís, in which are about 50 houses, densely populated, and close to one another and built on the sides of two rivers which meet, I found only one case of dimam kapièlu or remittent fever and the infection of that was caught on the Malay Peninsula, while the subject was gathering gittá. I could not even learn that it had been epidemic. One person said 2 years ago, they had it very bad, but on cross-examination I found that only children had been attacked and the disease was small-pox, on hearing which I began to rail at my informant for attempting to mislead me, when he answered " have you not dimam in both diseases?" this is a lesson for strangers to the native character to profit by.

From Kampong Bugís to the eastward the next village is Síglap.

This is situated at the base of a valley now drained, but which formerly, as I have in the first part of this paper adverted to, was an extensive fresh water marsh, from which most noxious malaria emanated. The village of Síglâp suffered in common with other localities, the natives being frequently attacked with intermittent fever and even with remittent. The first form of fever may be said to have been endemic to the village. At ebb tide the beach is exposed for about $\frac{1}{4}$ of a mile, when it is seen to be composed of sand and mud, but no coral. Here we have the same diseases produced from another cause to what we have found on the islands, for when that cause was renewed by the draining of the marsh the effect disappeared, and the village is now without a shadow of disease of an endemic nature. Further still to the eastward are the villages of Tánná Mérá Kíchí and Bésár, Bidu, all of which had intermittent fever frequently attacking the inhabitants, and sometimes, though seldom, they were subject to attacks of remittent fever. Both of these fevers have now almost entirely disappeared, since the district of Bidu and Tánná Mérá have been drained. To the west of Singapore and about $1\frac{1}{4}$ miles distant, is a village called Tánjong Págár, consisting of a row of houses stretching the length of $\frac{1}{2}$ a mile, built in single file on the beach, to the west of a promontory of that name. When I examined this village I found that at the extremity, towards Pulo Brání, in one house a female had died of remittent fever. 12 months previous many Chinese were attacked and died, during the S.W. monsoon. At the same time many Malays were attacked with intermittent fever, and in some cases that ended in remittent, according to their assertion. During my visit I saw one Chinaman in the last stage of remittent fever, from which it was impossible he could recover. On examining the beach close to the house we have sand and mud, and at spring tides a little coral is exposed, but there is a reef of coral, near half a mile in length, stretching from the west point of the village nearly S.W., and which approximates close to one extremity of the village and to that extremity of the village where I found remittent fever to be prevalent, while the other and distant extremity from the coral reef is free from it, according to the testimony of the villagers; the N.E. monsoon, which blows over the island of Singapore, is their healthy monsoon, but the S.W. monsoon is quite the contrary, and which, on the theory of exposed coral reefs being the cause, is easily explained by the fact of the *angin slatan* or south wind sweeping over

the reef just mentioned and bringing with it the effluvium generated by the decomposition of the Polyps and other animal matters. Further to the west we have the village of Telloh Blángá or New Harbour, the residence of H. H. the Malay chief, to which we have already adverted, and still further to the west we have a collection of huts to the number of 6 or 7 at a place called Pássir Pánjáng, the number of inhabitants being about 40, all of whom were healthy and accustomed to be so. The beach there is composed of mud and sand, but at low tides coral is exposed; behind the houses is a fresh water swamp of about 100 fathoms in length, but from which no active malaria arises, as men and children are healthy and look so. The last point of examination which I made was kámpong Gelám 15 miles to the eastward of Singapore. This consists of 30 houses and numbers about 200 to 300 inhabitants. There is little or no coral exposed; the surface soil and the beach is composed of Iron-clay-stone, a little ephemeral fever occurs, but intermittent or remittent fevers seldom or never.

I have now brought before the reader the materials, the facts, on which I originally based my theory; other strong and convincing confirmations have daily been brought to my notice, but will be reserved for a future number. On the facts now collated I must stand or fall, as from them I will draw my deductions. Around many of our islands near to this the island of Singapore, we have reefs of coral, formed by the labour of a small *gelatinous* body. This small animal in some species is so insignificant that 100 occupy a square inch, others are still smaller, so that 500 are comprised in that space; fixed by their bodies and only protruding their tentacula through the sides or stars observed in the coral, and causing by the motion of their fimbriated extremities gentle currents in the medium they live in, by which their bodies are fed and filled with sea water, from which the animals, amongst the smallest of created beings, extract the lime which exists in almost infinitesimal quantities, and with which they form a stony covering for themselves. At this work they proceed, adding compartment to compartment and building one story above another, hour by hour, day by day, until years, and centuries, and ages have elapsed, when, from depths unknown and perhaps unfathomable, they rise near the surface, when at a certain stage their place is taken by others and a different kind of coral is made suitable to that depth; these again rise, their places being successively taken at certain stages by others, until, having reached the surface,

a termination is put to the labours of all. The products of these labours are the coral reefs that line or fringe our shores, or form the Attoll islands which seem as resting places in a dreary waste of water. In ages gone by, their polyps have been at work toiling through the lapse of time, and leaving us the vestiges of their work in the mountain masses of limestone that are to be seen in all parts of the world. The fossiliferous strata, a portion of which is the product of coralline polyps, have been estimated to have a thickness of nearly 7 miles, so that the time occupied in their formation must have been immense. Mrs. Somerville says, "every river carries down mud, sand, or gravel to the sea, the Ganges brings down more than 700,000 cubic feet of mud every hour, the Yellow river in China 2,000,000, and the Mississippi still more, yet notwithstanding these great deposits, the Italian Hydrographer Manfredi has estimated that if the sediment of all the rivers of the globe, were spread equally over the bottom of the ocean, it would require a thousand years to raise its bed one foot so that at that rate it would require 3,960,000 years to raise the bed of the ocean above to the height of the fossiliferous strata." If it would take 1000 years for the sediment of all the rivers of the globe to raise the bed of the ocean one foot, what time, what labour, and what an immensity of labourers must have been required to have raised the barrier reefs to the east of Australia, which extend towards the Indian Archipelago 1000 miles, having an average breadth of $\frac{1}{4}$ of a mile and a depth of 200 feet, and this labour executed in spite of enemies as the Helotharia &c., and in defiance of storms, nay even courting the situations, where the waves are highest and the water most troubled. My admiration is lost in amazement, and I would exclaim if the Heavens shew the handiwork of the Lord, surely the Sea does shew his wonders. The majority of the species of coral, when they have reached within a short distance of the surface, cease their labours, and extend laterally, although there are in the Celebes, Java, and other places, masses of coral some feet higher than the level of the sea, yet that uprising has been the result of volcanic action. These corals that are found in deep water are not found living in shallow water, some species are found inhabiting the banks of reefs in one place at a depth of 3 feet, at another of 3 fathoms, and lastly some are found in reefs which are for some hours uncovered by the tide, and yet live, among which I have found the Madripora fringia and Meandrina cerebriformis. But the majority of these polyps

die on being exposed to the atmosphere, and on their death the breakers detach the masses from the living stock, to be washed upon the shallow reef, when, exposed to the action of the sun and rain, the polyps quickly decompose, and leave the calcarious matter to be rolled backwards and forwards by each successive wave, until reduced to a sandy detritus, it forms the beautiful beach of the coral girt islands, and by its mechanical effect when washed back by the ebbing tide destroys the living corals within its reach, and disposes them to undergo a similar transformation.

Wherever we have coral reefs exposed at ebb tide we have a great destruction of coralline polyps, and a decomposition of animal matter carried on in a gigantic scale, proportioned of course to the size of the reef. During this decomposition the same chemical and animal changes occur, the same gases are generated and germs created as in a similar decomposition of animal substances on land. If malaria is produced from animal decomposition on land, and we have a similar decomposition at sea, I think I am entitled to make my first deduction, that *wherever a coral reef is exposed at low water, animal decomposition will go on to an extent proportioned to the size of the reef, cæt: par: and that malaria will be the result of this decomposition, which is one and the principal cause of the fevers endemic in such localities.* In proof of this I refer my reader to what I have, on personal examination, found at Ayer Bándérá, Blákáng Mátí, Pulo Sákijáng, Pulo Serái and Tánjong Págár. Certain conditions increase or modify the applicability of this deduction. For instance, if a reef is extensive and a gentle trade wind in one monsoon blows over it and wafts the effluvium, and of a necessity the malaria, on habitations, situated to leeward, and if that wind is prevented continuing its progress by a hill, or a forest, by which perfect ventilation is prevented, more especially if we have the coral reef situated close to the base of the hill, which from its height lulls the wind, so that no benefit is received by the inhabitants from the contrary monsoon that should carry away all effluvium and malaria, then we have the malaria from coral developing itself in its intensest form, giving rise to a virulent endemic fever, as we see at Ayer Bándérá on the island of Blákáng Mátí, and, as we will see, in other countries; if the ventilation however is not altogether impeded, but merely imperfect, we have the fever much modified, so as to be changed to the intermittent from the remittent, as at kámpong Blákáng Mátí. From these premises my second deduction is drawn, *that from*

all exposed coral reefs malaria emanates, and the intensity of the malaria depends on the non diffusion of the poison from want of ventilation, or it may be modified by solution with the surrounding atmosphere, so that when it reaches a ventilated locality it is innocuous; as a drop of concentrated sulphuric acid will burn, but mingle it with a pint of water and its effect is lost. This latter part of the deduction is more applicable to localities which will be examined in Part three, as the Cocos Islands and some islands of the Pacific, than any locality near Singapore. My third deduction is *that mere proximity to a coral reef does not necessarily imply that the locality is obnoxious to fever;* for instance kámpong Kopit on Pulo Brání, is within $\frac{1}{2}$ a mile of Ayer Bándérá where remittent fever is endemic, yet is it only subject to epidemic fever; kámpong Serápong is seldom or never subject to fever and is only $\frac{1}{2}$ a mile inland from Ayer Bándérá; detached houses on the same island are only separated from the source of fever by a belt of mangroves, this also occurs in other islands as Pulo Sikrá, and the inhabitants of these houses are healthy. I am therefore entitled to draw, from these facts previously enlarged upon, my third deduction, that *mere proximity to a coral reef, does not necessarily imply, that the locality is obnoxious to fever, as the interposition of high land, or a belt of trees, as the primitive jungle or mangrove swamp, may act as an effectual barrier.*

It has been stated that fresh water kills the coral polyps,* and in my opinion even more quickly than exposure to the air or sunshine, for if a reef when exposed receives a fall of rain, the corals immediately blacken and a most intense stench is given forth. The detritus of coral and the sand from broken up land, destroy by mechanical means the delicate polyps; a fourth deduction may therefore be drawn *that when a large river opens into the sea, or when the sea is gaining on the land, but little living coral will be exposed, as the first prevents the formation of coral, and the second quickly destroys what is formed, covering it up so that at low tide sand and dead coral only are visible, and from which no malarious influence proceeds.* Instances of the effects of rivers will be given in

* See Darwin (on coral formations page 66,) who has entered minutely into this point, from whose work I first received the information which forms this my fourth deduction and which not being based on original data, cannot be considered as asserted for the first time, but the reader will on examining Darwin see a point of difference betwixt us regarding the degree of importance of fresh water and sandy detritus as destructive agents.

a future number, but on a small scale we have it exemplified at Passír Pánjáng and Sandy Point, and as a proof of the second part of the deduction, we have the islands of Sikéjáng and Bukum, while, at the islands of Siking and Serái, the beach being formed of Iron-clay-stone, is not so apt to form detritus, or sand, hence the flourishing appearance of the coral reefs in front and the unhealthiness of these islands compared to those near them.

We have shewn that where imperfect ventilation exists, or wind directly wafts the effluvium from a coral reef on an inhabited locality, fever is there more severe than in other places so circumstanced, but we have yet other conditions influencing the production and intensity of fever independent of the coral, as it were secondary agents modifying the primary. During the change of the monsoon in October and November and again in April and beginning of May, there are frequent calms, lulls of wind, a close muggy atmosphere surcharged with moisture and electricity; then we feel what tropical heats are, when after the frequent showers that fall at these times, the sun bursts out to appearance and in feeling unusually intense. This combination of heat and moisture is a principal medium for developing fever, while the sudden vicissitudes of temperature that daily occur predispose the body to receive the direct influence of the malaria. This malaria is also increased in quantity, for if during the ebb, we have a shower of rain and then sunshine, we have greater and quicker decomposition of the coralline polyps, and that combination of causes is more likely to occur during the changes of the monsoon, than at any other time: hence we are fully entitled to draw this conclusion *that during the change of a monsoon the locality subject to coral malaria, is more unhealthy than at any other time.* This of course applies to other situations where fever occurs from very different causes.

Having finished, to borrow an expression, the case for the prosecution, or, in other words, having laid before the reader in a condensed form the facts, and arguments, on which I base my theory, extracted from localities in the immediate vicinity of Singapore, I intended to have finished the subject by bringing forward other facts, even stronger, but drawn from sources which I have not personally examined, to add still more proofs to its correctness and exhibit its extensive applicability. But this the second part of my paper has grown so much upon me, anxious as I have been to keep it within due bounds, that I am reluctantly obliged to refer the reader of

this Journal to a future part, in which will be considered the applicability of this theory and no other, to explain the fever, for example of Batavia roads, Dílli, Timor and the west coast of Sumatra &c., and before concluding I will lay before the reader the objections which my Professional Brethren and others have brought against this theory.

ANTIQUITY OF THE CHINESE TRADE WITH INDIA AND THE INDIAN ARCHIPELAGO.

Chinese records only can enable us to discover at what period their junks began to frequent the Archipelago.* There is evidence of their trading to Java in the ninth century, and if this trade was then established, it is probable that they also visited Borneo in very remote times, and even before the Malay kingdom of Bruné was formed, for they were themselves engaged in the trade with India at least as early as the fourth century. In the thirteenth century this intercourse was considerable and evidently far from new. An opposite conclusion however may be drawn from the ten pages which the historian of the Indian Archipelago devotes to the early commerce of the Chinese in these and the Indian seas,† and we must therefore shortly examine the reasoning of an authority whose views on all subjects of the kind justly carry the greatest weight. Mr. Crawfurd certainly declares that "the most extensive, intimate, and probably the most ancient, of the foreign commercial relations of the Indian islands, is that with China,"‡ but he infers from Marco Polo's narrative that, previous to his voyage, Chinese navigators had not visited India, and that their intercourse with the Archipelago was not busy or active. The commentary by which this inference is supported is more ingenious than convincing, and we think that most persons who take up Marco Polo free from any preconceptions, will be impressed with the belief that he found a regular junk trade established with both. Marco Polo's voyage demands our attention in itself, because it is in every respect interesting and instructive. It carries us through the Archipelago two centuries before any European ship had passed the Cape, and while the rich trade and navigation to the eastward remained undisturbed in the same condition in which they had been dimly descried and described by the Greek, Alexandrian and Roman geographers. It throws light too on Ma-

* The zealous and penetrating researches of M. Stanilas Julien promise to cast full light on the early geographical knowledge and navigation of the Chinese.

† History of the Indian Archipelago, vol. iii. p. 154 to 164.

‡ With respect to the ancient *Indian* trade of China Mr. Crawfurd says, "there is nothing indeed in the character of the Chinese that would lead us to believe them capable of bold and perilous adventure, and I must, for this reason and others to be now mentioned, utterly discredit their distant voyages beyond the Indian islands to Malabar or the Persian Gulf."

layan literature, and, as we shall see, receives elucidation from it. But its chief importance for our present purpose lies in its being the first narrative which we possess of a voyage by Chinese junks to the westward. We gather from it that at the period of Marco Polo's voyage along the northern and western limits of the Archipelago, (about A. D. 1291), the Chinese were in the habit of making distant sea voyages in large junks. He gives a particular and accurate description of "the ships in which the merchants navigate to India."* Before describing India he says he will mention "the many islands lying in this sea to the eastward", and he then proceeds to describe Japan, and to give a general account of the numerous islands in the sea of Zin, which evidently includes the seas of China and the Archipelago. He distinctly states that "the mariners of Zaitun (Amoy) and Kinsai (Hong-chew-fou), who visit these islands, gain great profits; but spend a year on the voyage, going in winter and returning in the summer; for the wind in these seasons blows only from two different quarters, one of which carries them thither and the other brings them back."† After describing Ciampa, which he had visited, he introduces a description of Java, which evidently includes Borneo and Java.‡ He says that "good mariners who know it intimately describe it as the largest island in the world, with a cir-

* The travels of Marco Polo (ed. of 1844 by Mr. Murray) p. 271.

† Ib. p. 276.

‡ Ib. p. 278. Before the Malays rose into note, the Javanese were the single civilized and dominant race of the Archipelago. Java, flourishing in its fertility, population, and arts, cast all the rest of the eastern islands into the shade. One or two sea ports in it nearly concentrated the regards of foreign commercial nations, who, knowing no more of Borneo than a few comparatively insignificant ports on its southern and western coasts inhabited by Javanese and subject to Java, naturally extended the name to these coasts. The names of Jabadas, Zabaje, and Zaba, used more anciently by Grecian, Indian and Arabian geographers are evidently one and the same. M. Dulaurier in the Journal Asiatique for June 1846 (p. 544-571) has published a highly interesting document which he found at the end of a Malay work, Hikayet raja raja Pasé, in Raffles collection belonging to the Royal Asiatic Society. This is a list of the countries dependent on the empire of Majapahit at the epoch of its destruction. It appears however to include all the places subject to it during previous times. The names are as follows: they are well known to this day. 1, Pase. 2, Tambelan. 3, Jemaja [M. Dulaurier is ignorant of this place. It is one of the Anambas, properly Anamblas, islands] 4, Bungun [probably Bungoran, the Grand Natuna island, an r having dropped] 5, Siran. 6, Surabaya. 7, Pulo Laut. 8, Pulo Tioman. 9, Pulo Tingi. 10, Kaiimata. 11, Blitong. 12, Bungka (Banka). 13, Linga. 14, Riu (Rhio). 15, Bentan [M. Dulaurier erroneously romanizes this name Bantam, and is hence misled into believing it to be Bantam in Java. It is the island miscalled Bintang by Europeans, on the eastern coast of which the small island of Rhio lies]. 16, Bulang [evidently the

cuit of more than 3000 miles" and that "many merchants from Zaitun and Mangi (Mantze, the nine southern provinces of China at that time) come and carry on a great and profitable trade there."*

When Marco Polo has finished his account of the islands lying to the eastward, and comes to describe the different countries of India at which the junks appear to have touched during their 18 months' voyage from Sumatra to Persia, he expressly mentions the trade which some of them had with China. Thus he says that many mer-

island or islands so called to the west of Béntán. M. Dulaurier supposes it to be in Celebes]. 17, Sambas. 18, Mampawa. 19, Sukadana. 20, Kuta ringin. 21, Siatan [M. D. cannot identify this. It must be Siantan, one of the Natunas, an n having been omitted. In the Sjara Malayu, Siantan is mentioned with Indragiri in Sumatra as countries which the ruler of Majapahit gave to Sultan Mansur Shaw of Malacca when he married his daughter Radin Galah Chandra Kirana; this was in A.D. 1380]. 22, Banjer Masin. 23, Kutas [probably Koti, an s having been written or mistaken for an e]. 24, Pasir. 25, Birumal. 26, Jambi. 27, Plembang. 28, Ujong Tana, [Johore or Singapore]. 29, Bandan [Banda]. 30, Bima. 31, Sambawa. 32 Salaparang [Lombok]. 33, Seram. 34, Gorontala. 35, Bali. 36, Balambangan. [Differing from M. Dulaurier, we would consider this the Javanese and not the Borneon Balambangan.]

* From the mode in which his notice of it is introduced, it may be inferred that the junks bound for it first followed the coast of China and Cianba to Pulo Condore, and thence crossing the China sea by a south and south easterly course arrived on the coast of Borneo. Commentators assume that Cianba is Ciampa, and the names are probably identical, but it seems evident to us that Marco Polo describes under that name not the province south of Anam to which it has long been confined, but the then powerful kingdom of Kamboja,* with which Anam itself was then incorporated, having been subdued by it about the end of the preceding century.† The invasion by the Chinese in 1298 which Marco Polo mentions was not directed against the southern province of Ciampa but the kingdom of Kamboja. This explanation does away with an insurmountable objection to the received opinion, the fact namely that the distance from Ciampa to Pulo Condore which Marco Polo had an opportunity of estimating himself, is expressly stated to be about 700 miles, whereas even from the most northern limit of Ciampa proper, Phuyen, the distance is only about 300 miles. Sailing from Pulo Condore S.E. for 500 miles Lachac is reached. This country has proved a great stumbling block to all the commentators. The position and description themselves would leave no doubt on our minds that it was an inland country of Borneo in the direction of Sambas or Pontianak, perhaps Landak or Lawe. In Valentyn's map of Borneo an island is marked opposite the mouths of the Lawe called Layak.

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* Soleyman, the Arabian traveller of the 9th century, mentions two kingdoms under the name of Mujet and Mabet. From the description the former is probably Kamboja (often pronounced Kamuja) and the latter Anam.

† Crawfurds Embassy to Siam, vol. ii. p. 245, 301.

See also Dr. Le Fevre's Details respecting Cochin China (ante, vol. i. p. 45) from which we may infer that the country to the south of Tonquin was called Ciampa in the 15th century.

chants from *Manji*, Arabia and the Levant resort to Coilon to the east of Cape Comorin,* that "ships came to Eli from Manji and other parts in the summer, load in eight days and depart as soon as possible, there being no port, but dangerous sand banks,"† and when speaking of Malabar he says, "ships come even from the great province of Manji."‡ To the north of Malabar there is no more mention of the Manji traders, so that it was the furthest limit to which Chinese junks went on the west coast of India.

The Arabian traveller Ibn-Bathoutha, who visited China from India in 1345 or 1346, gives the most direct confirmation to this account, since he relates that he found Chinese junks lying at Calicut and embarked on one of them for Sumatra. Chinese junks at that period frequented Sumatra, for the king of Soumouthra, after entertaining him for 15 days, caused one to be made ready to receive him.§ In 21 days they arrived at the fort of Kakoula in Java where they found a number of junks, which he says were disposed to piracy. 34 days more brought them into the sea Kahel‖ which they traversed in 37 days, although the usual period was 40 to 50 days. From the country of Thawalisy¶ they were carried by a favourable wind in 15 days to China, apparently to the port of Hang-Cheou-fou. When the time came to return he repaired to Zeytoun (Amoy probably) where he says "I found the junks ready to depart for India and amongst the number a junk which belonged to El-Melek Daher (the king of Soumouthra) and the crew of which were Mahomedans." On the 10th day they neared Thawalisy when heavy rain commenced and hid the sun for 10 days. They were 42 days without knowing in what sea they were. At last a favorable wind arose, and in 2 months more they arrived at Soumouthra. 40 days carried them to Koulam in Malabar. Ibn-Bathoutha's description of the junks and the mode of navigation agrees with that of the Venetian traveller. Each of them he says is towed by 3 vessels moved by oars. The junk itself has 50 oars as large as masts to each of which are attached two thick ropes like cables. Fifteen men pull

* The travels of Marco Polo, (ed. of 1844 by Mr. Murray) p. 310.

† Ib. p. 312. He adds that "those of Manji are least apprehensive, being provided with large wooden anchors", just as they are at this day.

‡ Ib. p. 313.

§ De l' Archipel d' Asie, par Ibn Bathoutha, traduite de l' arabe par M. Ed. Dulaurier. *Journal Asiatique*. Fev. 1847, p. 114.

‖ Supposed by M. Dulaurier to be the China Sea, Journ. As. p. 250.

¶ Supposed by M. Dulaurier to be Ciampa, Anam or Tonquin, Ib. p. 250. The first syllable would rather lead us to conjecture that it is Siam.

the oar one way and other fifteen draw it back.* The vessels described by Marco Polo are smaller; they were moved by oars, on each of which four hands were employed † Two boats accompanied and often assisted in dragging them.‡

From Arabian writings we know that in the 9th century a regular trade was carried on by the Arabs with China,§ and this was probably first established several centuries previously. In the 8th century Arabs and Persians were settled at Canton in great numbers.‖ Even if the Chinese had not themselves found the way to the Indian Archipelago they must soon have learned it from the Arabs. According to Chinese accounts referred to by Mr. Crawfurd, and which were procured by him in Java, they became acquainted with the Archipelago in the fifth century. But Chinese and Arabic writings carry back their western trade to an earlier period. In M. Dulaurier's highly instructive observations on M. Reinaud's new edition of the Arabic travels to India and China in the 9th century¶ we are furnished with the following resumé of these authorities: "Although a celebrated English historian, Gibbon, shews himself little disposed to believe in the ancient navigation of the Chinese in the Indian sea, it is not the less certain now, from the narrative of the travels of the Budhist priest Fa-hien, that their ships in the 4th century of our era resorted to the Bay of Bengal and to Ceylon, and the itenerary of another Chinese traveller named Hiouan-thsang, who lived at the commencement of the 7th. century, conducts along the whole western coast of India to the mouth of the Indus. We know that they frequented these parts as well as the Persian Gulf under the reign of the dynasty of Thang. Two Arab writers cited by M. Reinaud, Massoudi and Hamza of Ispahan, one of the 9th. century of our era and the other of the 10th., agree in saying that in the first half of the 5th. century the city of Hira, to the south east of ancient Babylon, at some distance from the present bed of the Euphrates, and which was then the chief place of a principality subject to Persia, saw constantly moored before its houses ships from India and China. Two other Arab authors, the geographer Edrisi, who

* Ib. p. 235.

† The junks that visit Singapore from Macoa are still provided with oars.

‡ Hugh Murray's ed. of Marco Polo p. 271.

§ Travels of two Mahomedans in India and China in the ninth century Harris p. 522. Kerr, vol. i. p. 47.

‖ p. 156. ¶ Journal Asiatique, August-Sept. 1846 p. 140.

lived in the 12th. century, and the celebrated traveller Ibn Bathoutha, who in the 14th. traversed nearly the whole world known at that epoch, tell us that Chinese ships resorted to Ceylon, and on the south west coast of India to Koulam, Calicut and Hyly."

It is clear that in Marco Polo's time the Chinese had a large external commerce and that their ports and large rivers were as much crowded with native shipping as they are now.* Even the government at that period appears to have encouraged navigation and been desirous of maritime conquest. Kublai Khan sent two great fleets to conquer distant countries. The first, of 4000 vessels and 240,000 men, invaded Japan in 1269, and the second in 1292 was sent against Jawa (Borneo). The truth will probably be found to be that the aggregate of the external trade carried on in national vessels has remained nearly stationary since the 13th century, if it has not rather retrograded.

Mr. Crawfurd, in the course of his depreciatory remarks on the navigation of the Chinese at the period in question, dwells upon the circumstance of Marco Polo's fleet having made a coasting voyage along the shores of China, Anam, &c., to Sumatra. This course however happens to be the very one which junks for the Archipelago invariably pursue to this day. The junks from the northern ports keep the mountains of China in sight till they reach the southwest extremity of the empire, the large island of Hailam (Hainan). Thence those of less burden follow the coast of Tonquin, while the larger are obliged to stand across for a high mountain in Anam, which, after the

* Thus he says of Gan-fu (Ningpo) that "it has a very fine port, with large ships, and much merchandize of immense value from India and other quarters," and of Zai-tun (Amoy,) that "it is a noble port where all the ships of India arrive, and for one laden with pepper which comes from Alexandria to be sold throughout Christendom, there go to that city a hundred." It has been the singular fortune of Marco Polo to anticipate by several centuries the geographical knowledge of Europe, and thus to have had a continually growing reputation. Every extension of our acquaintance with Eastern Asia has confirmed his narrative, so long considered as little better than a romance, and he is now justly regarded as "the greatest of land travellers" as well as one of the most "truth loving" (Humboldt, Cosmos.) His description of the Yang-tse-kiang has been proved in the 19th. century to be founded on fact. He says it is the largest river [then known] in the world "and on account of the many cities on it, the ships navigating and the goods conveyed by means of it are more numerous and valuable than in all the cities of Christendom and the adjacent seas besides. I tell you I have seen at that city (Sin-gui) no fewer than 5000 ships sailing at once on its stream. For that river flows through 16 provinces and has more than 200 great towns on its banks." p. 183.

lapse of 2 or 3 days, rises on the horizon. They now turn to the S.E. along the coast of Anam, which they keep in view for about 4 days, and then make for the mountain of Kuntun (Pulo Condor). This is, as it appears to have in Marco Polo's time, the great leading mark of the voyage.* When necessary they touch and take in water here. From Condor to Bé Wá Swá (Bintang hill) they are guided by the numerous and well marked islands which lie in the western borders of the China Sea. Té Pwá, which appears to be Tíomán, is a leading mark. Bintang hill serves as a finger post, guiding the junks for Singapore into the strait, and those for Java southward along the outer coast of the Johore Archipelago. The length of Marco Polo's voyage from Amoy to Sumatra, three months, is also insisted on by Mr. Crawfurd, who considers that a Chinese junk would now perform it in probably one fourth of the time. But it being certain, we think, that the voyage terminated on the northern coast of Sumatra, it is quite possible for a fleet of 14 junks which required to keep together to take 3 months at the present time to accomplish a similar voyage. A Chinese trader who has come annually to Singapore in junks for many years tells us that he has had as long a passage as 60 days, although the average length is 18 to 20 days.

Great uncertainty and contrariety of opinion have prevailed in the identification of the kingdoms in Sumatra mentioned by Marco Polo. Mr. Marsden, with all his local knowledge and extensive acquaintance with Malayan literature, appears to have overlooked the probability of the voyager's knowledge of the island being confined to the part of the coast which he visited, the only part too with which the Arab and Chinese traders between India and China were likely to be familiar. Having correctly identified the first three kingdoms, it is curious that the circumstance of their being mentioned in the exact geographical order in which they would be visited by a voyager, who had come up the straits of Malacca and passed along the north coast of Sumatra, did not suggest to him the possibility of the others being found on the north coast also. Mr. Hugh Murray, the latest editor of Marco Polo, rejects all Mr. Marsden's localities, and attempts to include a little of every side of the island. The Sijárá Málâyu en-

* Marco Polo calls the Condor islands, Sondur and Condur. The Sanderfulat (Sander Pulo) of the Arab traveller of the 9th century, "an island which has fresh water" and one month's sail from China, is also, without doubt, Pulo Condor.

ables us, we think, to demonstrate that Mr. Marsden correctly fixed the position of the first three kingdoms, and that all the others are to be found in their order along the same coast.

The first that Marco Polo reached was Ferlech (the Arabic pronunciation of Perlak or Diamond Point). The next is Basman, evidently Pácem or Pásé. Then follows Sámárá, the Soumouthra of Ibn Bathoutha, and Samadra of the Malay annals, called now Samalanga or Samarlanga. Dagroian, the next in order, was probably the place now called Gigiran. Lambri is next mentioned. Mr. Marsden thinks this must be Jambi, but Mr. Murray properly identifies it with the Lambri which occurs in a list by De Barros of the kingdoms along the coast of Sumatra.*

The Sijára Máláyu tells us that the first Arab missionary to Sumatra, Shaik Ismail, landed at Pasuri (Fansur), called Fansuri by the Arabs, from which he proceeded to Lamírí (Lambri) and Háru (Pásé). At Pásé he asked the people where Samadra was, when he was informed that he had passed it. He went on to the country of Perlák, and then sailed back to Samadra, which this narrative thus proves to have lain between Lambri and Pásé. Marco Polo's three months' voyage therefore clearly ended on the north coast.†

* According to Mr. Marsden's identifications the order in which the kingdoms are mentioned is this: Perlak, Pase, and Samarlanga on the north coast, and Indragiri, Jambi and Kampar on the west coast. But why should all the other kingdoms around the island be omitted? At Samalanga where the fleet lay 5 months they were as likely to hear of these as of the three rivers in question. Mr. Murray's identifications give us the following order. Siak on the east coast, Passummah an inland country to the S. E. of Bencoolen on the west coast, Samanka at the southern extremity, Ayer Aje or Inprapura, on the east coast, Lambri towards the extreme N. W. and lastly Barus to the south again.

† He describes the inhabitants of Samara as idolatrous. In the next century Ibn Bathoutha found them Mahomedans. The chief seat of power along this coast appears from Malay histories to have shifted frequently.

NOTICES OF CHINESE INTERCOURSE WITH BORNEO PROPER PRIOR TO THE ESTABLISHMENT OF SINGAPORE IN 1819.

The precise period at which Chinese first resorted to Borneo Proper must be matter of conjecture. As it appears to have been early noted for its pepper, camphor, and gold, and these commodities were amongst the principal imports into China from the eastern seas in ancient times,* we may believe that the junks, which must have passed close to Borneo on their way to and from Java, early began to touch occasionally at some of the ports on the western coast. The Borneans themselves tell us that they are in part descended from Chinese who settled in Bruné. There are so many independent traditions to the same effect that, although all vague, we are not warranted in rejecting them. According to the Sulu annals a Chinese emperor or chief, named Songtiping, brought a Chinese colony to Borneo, and settled at the northern ports about A. D. 1375.† His daughter was married to a celebrated chief of Arabia, Sherif Alí, who had resorted there for commerce. There is nothing improbable in this, because we know that about a century previously Borneo was invaded by a fleet sent by Kublai Khan.‡ Divested of Malayan exaggerations the fact appears to be that a large colony under a leader settled in Bruné, and that the Arab or Malay chief of the country received him in a friendly manner and married his daughter.§ The subsequent rulers have all Malay names, which would not have been the case if Songtiping had established a Chinese dynasty. Mr. Low says that the Borneans believe that their kingdom was first formed by large settlements of Chinese (Sarawak &c., p. 94), and we have heard Chinese in Singapore talk of a king of

* Marco Polo says of Java (Borneo and Java) that "the territory is very rich, yielding pepper, nutmegs, galanga, cubebs, cloves and all the richest spices. Many merchants from Zaitun come and carry on a great and profitable trade. Its treasure (gold) also is so immense, that it can scarcely be estimated." The last sentence must refer to Borneo. Of Lochac, apparently a country in Borneo in the vicinity of Sambas or Pontianak, he says "Brazil wood is in abundance and gold in almost incredible quantities."

† Hunt's Sulus p. 32.

‡ The Malay history of Malacca mentions a colony of Chinese in Plembang prior to the foundation of Singapore.

§ The Chinese settled in Java sometimes, to gain the favour of the native princes, brought beautiful women from China to present to them.

their nation who reigned in Brunéat some ancient date. But the account of their tradition given by the writer of the Notices in the Chinese Repository (Aug. 1838) is probably the correct one. According to him they trace their origin to three stocks—Johore Malays, Chinese and Serips (probably Arab Serifs).

The tradition in question is confirmed by the large Chinese population and trade which Europeans found in Borneo during the 17th and 18th centuries. Mr. Hunt indeed says, "when the Portuguese [Spanish] first visited Borneo in 1520 [1521] the whole island was in a most flourishing state. The number of Chinese that had settled on her shores was immense; the products of their industry, and an extensive commerce with China in junks, gave her land and cities a far different aspect from her decayed appearance at this day, and their princes and courts exhibited a splendour and displayed a magnificence which has long since vanished." Mr. Hunt does not give his authority for the first part of this statement. The translation of Pigafetta's narrative which we have, does not mention the Chinese, although the flourishing state in which the port was found by the Spaniards,* implies the existence of a large trade in which the Chinese must have taken a part. The circumstance of van Noort in 1600 employing a Chinese to open an intercourse with Brunéi,† seems to shew that Chinese were well acquainted with the customs of the place and probably established there. During the 18th century we have more accurate statements respecting the extent of the junk trade with Borneo. In almost every port frequented by Europeans we have from time to time a notice of the junks which regularly visited them. Thus when the English were at Banjermassing in 1702,‡ four junks arrived during the monsoon, each 15 fathoms long and 4 broad, with cargoes of porcelain ware, China silk, tea pots, umbrellas, &c., which were bought by the Javanese merchants and by the Chinese from Samarang. These junks took return cargoes of pepper.§ In 1712 an embassy was sent from Banjermassing to invite the Dutch to trade there. It

* *ante* p. 498. † *ante* p. 505. ‡ *ante* p. 508.

§ Valentyn, vol. iii. p. 248. "At Banjermassing a very large trade is carried on by different nations who resort to this place and other villages of the island, amongst whom the Chinese, Siamese, Johorese, Javanese, Palem-bangers, Portuguese, English and Netherlanders are the principal, but the Chinese form a large portion of the inhabitants of Banjermassing." *Oud en Nieuw Oost Indien* vol. III. p, 237. Ten or Twelve junks came annually from China, Siam and Johore.

having been agreed that all the pepper should be delivered to them, ships were despatched, but on arriving at Banjermassing they learned that some Chinese junks had been before them and carried away all the pepper.* Roggewein in 1721 mentions the large fleets of China junks, laden with the commodities of that empire, which annually arrive in Borneo, and observes that as the Chinese were in possession of all the trade of this island before the Portuguese discovered a passage to India by the Cape, so it had in a great measure fallen into their hands since the Europeans had declined settling there. From Valentyn's great work published in 1726, we learn that the commerce of Borneo in the earlier part of the century was extensive, and that the Chinese took an active part in it. He gives few particulars respecting Brunć, because his countrymen appear to have disliked and avoided the port from the time of their first visit to it, but he tells us that the people were considered to be the wealthiest of the whole island, on account of the superiority of the gold and camphor obtained there in exchange for cloths.† When the Dutch in 1748 compelled the king of Banjermassing to give them a monopoly of his trade, he reserved the liberty of allowing the Chinese to take 500,000 pounds of pepper.‡

We may pass over intermediate notices and extract that of Forrest which relates to Brunć. "Considerable", says that very observing and careful writer, "is the commerce between China and Borneo, somewhat like the trade between Europe and America. Seven junks were at Borneo in 1775. They carry to China great quantities of black wood, which is worked up there into furniture, &c.; it is bought for about two dollars a picul and sold for five or six: also ratans, dammer, a kind of resin, clove bark, swallo, tortoiseshell, birds nests, &c. articles such as are carried from Sooloo to China. The best native camphire is exported hence; superior, I have been told, to the Barroos campaire on Sumatra. It looks no better, but is much dearer, selling for ten or twelve Spanish dollars the Chinese catty; Barroos camphire, looking as well, being worth no more than seven and eight dollars a catty. The Chinese are good judges of camphire. A great deal of this valuable drug comes from those parts of the island Borneo, that were ceded to us by the Sooloos. At Borneo town, the Chinese sometimes build junks, which they load with the rough produce of the island Borneo, and send thence to China. I have

* Ib. p. 247-8. † Vol. III. p. 242.
‡ Malte Brun's Geography vol. III p. 481.

seen a dock close to the town, in which a China junk of 500 tons had lately been built, worth 2500 teals, 8000 in China. Could these junks come readily at our woollens, they would distribute immense quantities through the northern parts of China.

"Here are many Chinese settled, who have pepper gardens. They do not let the vine, which bears the pepper, twist round a chinkareen tree, as is the custom on Sumatra; but drive a pole, or rather a stout post, into the ground, so that the vine is not robbed of its nourishment. The Chinese keep the ground very clean between the rows of vine; and I have seen them pull off the vine leaves; saying, they did it that the pepper corn might have more sun. I have here counted seventy, sometimes seventy-five, corns of pepper on one stalk; which is more than the stalks produce on Sumatra; and I am apt to think the chinkareens on Sumatra are hurtful, as they not only rob the ground, but take up much of the planter's time in trimming the luxuriant branches, that these may not overshade the vine. On Sumatra, the country is full of wood, as here on Borneo; so were our planters there to adopt the Bornean method, they never could find a scarcity of posts; which, if made of what is called iron wood, will remain in the ground many years without rotting.

"The Chinese here are very active and industrious. They bring all kinds of the manufactures of China, and keep shops on board their junks, as well as ashore; but the Borneans do their best to preclude them from dealing with the Maroots, reserving the trade for themselves. I do not find that the Maroots grow pepper. The Chinese alone plant it. It is all sent to China. We found it dearer than at Passir, where it was ten dollars a picul: here it is fourteen and fifteen. I am surprised they do not encourage the Maroots to plant this commodity. This was Mr. Dalrymple's idea in his plan concerning Balambangan.

"It gives an European pleasure to see the regularity and cleanliness on board the Chinese vessels. To the latter much contributes their not using tar. Their tanks for water are sweet and convenient. They have the art of putting a mixture of lime and oil into their seams on the deck, &c. which hardens and keeps them tight. This is much cleaner than pitch; but, if the deck worked at sea, I apprehend this calking would break, and the junk prove leaky. Their cook rooms are remarkably neat. The crew all eat off china; and in a harbour every one is employed without noise about his own business." *

* Voyage to New Guinea p. 381.

At another place Forrest informs us that 5 or 6 junks of 500 or 600 tons burden came annually to Bruné from Amoy. Mr. Crawfurd says that when the trade was in activity 2 junks came yearly from Shanghai, 2 from Limpo, 2 from Amoy, 1 from Canton and 2 Portuguese ships from Macao.* Towards the end of the century the Government, which is almost entirely a reflection of the character of the reigning prince, became tyrannical, rapacious and piratical, so that the foreign trade of Bruné fell almost entirely away, and Chinese vessels did not venture to approach the coast. Mr. Hunt says that in 1809 not a single junk had visited Bruné for years. With the Chinese trade the Chinese population also rapidly declined, and the pepper gardens in which many of them had been employed were neglected. At the time of the establishment of Singapore their numbers in the town did not exceed 500.†

* Singapore Chronicle, Dec. 1824. † Ibid.

JOURNAL OF A VOYAGE TO THE EASTERN COAST AND ISLANDS OF JOHORE.

The motives for undertaking this voyage, and the kindness of the honorable the Governor in enabling me to do so by placing one of the gunboats at my disposal for a month, have been mentioned in the introduction to my account of the Orang Binua of Johore.* The outline which was there given of the voyage, and the subsequent journey across the Peninsula, renders any further explanation unnecessary now. The most interesting of my observations have been embodied in that paper, and in others on the basin of the river Sidíli, Pulo Tingí, Pulo Tíoman, the river Indau, the geography and geology of Johore &c., most of which will be inserted from time to time in the Journal,† but as this portion of the Peninsula is hardly at all known, has never been described, and may not be soon visited again, the remainder of my notes, although of comparatively small value, may be here given in the form of a personal narrative, and much of them nearly in the same rough state in which they were jotted down during the voyage and subsequent journey.

SINGAPORE TO KWALLA SIDILI.

8th. September, 1847.—We left Singapore on the morning of the 8th. Sept. and were off Tánjong Penyuso (Point Romaniá,) the south eastern extremity of the Peninsula, at 2 o'clock P. M. The scenery throughout the Strait is pleasing, although devoid of any striking features after we have got accustomed to its general character, and lost sight of the town of Singapore and the islands to the westward of it. As we leave the harbour, and proceed eastward towards Tánjong Kátong, one of the finest combinations which the whole Strait presents is given to view. At our side, on the left, is a low sandy beach, over which rises a green shrubby jungle. The line of the distant forest, marking the limit of the cultivated plain, is seen above this, with here and there a small clump of cocoanut trees. In front, the beach terminates in the thick mass of luxuriant cocoanuts at the point of Kátong, off which the lines of fishing stakes appear faintly against the hazy horizon. This point hides all the coast to the eastward, and the opening between it and the distant island of

* *Ante*, vol. i. p. 242.

† That is if room can be obtained for them, which seems very doubtful.

Béntán, is the only apparent entrance into the wide inland sea which lies to the right and behind us, surrounded on all sides by low hills in connected ranges or scattered islet groups. Looking back, the sandy beach is continued till the shrubby jungle disappears, and the close packed huts and sheds of Tánjong Ru take its place. Advancing from behind these, and stretching across the foreground, we see, rising over the beach of the harbour, the neat mansions of Kámpong Glám half concealed by trees, the green and wooded Government hill, and on its right the extremity of the Claymore range, a dark acclivity bearing darker spice trees, while the depression between them is filled by the grey cloud like foliage of the more inland elevations. To the left of Government hill, the mass of godowns on the western bank of the river, and the smooth green undulations of Pearl's and the adjacent hills, are seen surmounted by the abrupt jungle covered heights of the more distant Teloh Blángá range. As the sun frees itself from the haze of the horizon, and strikes this scene with its level rays, the houses put off their dull morning garniture, and become so many points of beaming white light, while from the dark grey of the hills over them, some country seats, hitherto unseen, break out. In the foreground, from the undulating and rippled sheet of water, rise the hulls and rigging of numerous ships and smaller vessels, and the sail of a boat in motion occasionally sweeps slowly along, sometimes hidden amongst them, and, as it emerges, concealing in its turn the houses before which it passes. To the south of the town, the iron stained cliffs of the range terminating at Tánjong Bátu rise with a dull rusty hue, reminding us, by the dark tinge of the more ironmasked rocks, of the far different aspect which the scene, now adorned by art and cultivated nature, must have born before there was any human eye to see it, when, amidst the heaving of the region with the throes of the molten plutonic ocean below, the massive strata were bent and broken like reeds, and thrust up from their horizontal position beneath the bed of the sea, till they stood in perpendicular masses above its surface, while lurid ferruginous exhalations ascended through the rents and fissures, and "the smoke of the country went up as the smoke of a furnace."

Beyond Tánjong Bátu, the hills of Pulo Brání and Bláking Mátí, at a distance of about four miles, continue the circuit to the southward, the sea rapidly widening as we follow the crowd of islands that seems to occupy all the Strait to the southwest. A little open sea, the coast of the crumbling Pulo Sikukor the single barren islet

of the group, a patch of open sea again, the range of Pulo Sákíjáng covered with pineapples and fruit trees, then a broader strait broken by several islets the farthest of which is about twelve miles distant, while those on its southern side become almost continuous, the distant blue peaks of Sugí, Glám Tuá and Gunong Bulán appearing to rise from amongst the low hills of the nearer islets, complete the western borders of the sea and bring the eye to Báttám island, whose long dark undulating band of jungle, here advancing in bold promontories of indurated sandstone and granite* and there retiring in deep bays, stretches from west to east, constituting the entire southern boundary of this portion of the Strait, and blending at its extremity with the more dim outline of the coast of Béntán. Its western half is more abruptly undulating than the eastern, attaining a considerable elevation in Bukit Sábímbá, which gives its name to the rude tribe that haunts the adjacent forests.† The sea across which we follow the shores of Báttám, and which stretches

* Why is this deeply indented coast so different from that of Singapore on the northern side of the Strait, which from Tanjong Ru eastward presents a curve of very slight undulations? Why is the depression that constitutes the wide basin on which the harbour of Singapore lies, filled up with debris in its northern extremity, constituting the plain of Singapore, and left open in the southern, Battam Bay? The promontory of Treng, which separates Battam from Bulan Bay, is mostly sandstone like the Red Cliff ranges on the Singapore side, but the granite on its eastern side has hardened it, and served to protect it from abrasion. The sandstone on the Singapore coast, on the contrary, does not come in contact with the granite till considerably beyond the Large Red cliffs towards the Changy promontory, and it has consequently acquired little cohesion. Indeed so little has it been directly affected by the plutonic action that went on in its vicinity, that its strata remain nearly horizontal. This soft sandstone has readily yielded to the waves and currents, which have undermined its seaward hills, ground the falling masses into sand and sediment, and in this state carried them to the westward, where it has deposited them in the shape of long sand banks in the ancient bay of Singapore. These bands of sand, marking the set of the currents, and the direction of the coast of this bay at different epochs, may be traced on the plain of Singapore. The same process still goes on, the Red Cliffs continue to give way, and the newest bands of sand may be followed along the coast to Tanjong Ru, which is causing the north eastern part of the harbour to be filled up. The mass of sand alone that has been laid down by the sea to the westward of the Red Cliff hills is so great, that we must believe the strait between them and the opposite promontory of Treng was considerably narrower, when the waves of the basin to the west rolled in over the greater part of the space now forming the districts of Siglap, Páyá Lebár, Kálláng, Géláng, and Rochor (See *Sketch of the Physical Geography and Geology of the Malay Peninsula*, ante p. 133, 134.)

† See "The Orang Sabimba," ante, vol. i. p. 295.

to the eastward till lost in the fog which rests over the China Sea, is a beautiful sheet of water, about nine miles in breadth and, unlike the western portion of the Strait opposite Singapore island, its smooth surface, more resembliug that of a lake than an arm of the ocean, is not interrupted by a single island.* The parallels of stratification and elevation, for on the whole they are here nearly coincident, on which the Teloh Blángá range, Blákáng Máti, the Sákíjángs and the Sámbos are disposed, separate these two strongly marked divisions of the Strait; and it is worthy of note that the portion of Singapore island lying to the north west of the insular part of the Strait partakes of the same character, being nothing but a series of irregular peninsulas separated by numerous creeks, which penetrate close to the granitic elevation of Bukit Pándán and Bukit Tímáh.

Of the character presented by the Strait as we proceeded to its eastern entrance, I will only say here that it is throughout bordered by land of very slight elevation, covered with continuous dark forest, and having the surface uneven from the number of low hills and hilly ranges. In this respect the mainland does not differ from the islands. It has three hills which rise boldly above the general level, Gunong Bau† (749 feet high‡) Márbukit§ (661 feet) and Bukit Sántí‖ (645 feet). In the same way Bukit Timáh (530 feet) and some less elevated hills protrude above the Singapore level, and Gunong Béntán¶ (1212 feet) and Bukit Kíjáng** (759 feet) above that of Pulo Béntán.†† Báttam and Béntán are in general somewhat more elevated than Singapore, but the configuration of all the land on both sides of the Strait follows one plan. It is a congeries of hilly ranges separated by narrow vallies opening into small alluvial plains or marshes, which are penetrated by salt water creeks. The coasts of the eastern division of the Strait are more abraded than those further west. They are exposed to the strong currents and heavy waves of the China sea, and the difference of exposure is at once apparent on reaching Tánjong Pingráng in the

* There are a few small ones close to the shore of Battam which the eye does not distinguish.

† Little Johore hill.

‡ All these heights are from trigonometrical measurements by J. T. Thomson, Esq.

§ Johore hill.

‖ Barbukit.

¶ Bintang large hill.

** Bintang small hill.

†† Bintang island.

remarkable increase in the size of the water worn pebbles.* The coast of the mainland from Tánjong Pingráng to Tánjong Penyusoh is the extremity of a hilly peninsula about 40 miles long† and 15 miles broad, which stretches S.S.E. from the last mountain group of the Peninsula,‡ having the China sea on the one side and the generally broad but often contracted valley of the Johore river and estuary on the other. The basin of the Sídílí river may be considered as marking its original boundary to the north. This peninsula consists of low connected ranges which often stretch parallel to each other for some length, until the outer ones subside below the level of the sea or marshes, when small bays and inlets are formed, into which the streams and creeks of the little vallies and hollows flow. Some of the rivers or creeks thus produced are of considerable size,§ and have a peculiarly wild and sequestered character, being generally destitute of all human inhabitants, save, at times, a few Támbus in their boats in those opening into the China sea, and a few of the Orang Sletár in those that feed the Johore river. With the exception of a straggling line of narrow and mostly neglected clearings, the Bugis town of Johore Lámá, and a few small villages, on the bank of that river, the whole peninsula is covered with a thick jungle.

At 2 o'clock we passed Pulo Penyuso, which is rocky, exposing a brownish face shelving into the sea and intersected by divisional planes,—having thus a close resemblance to the eastern face of Pu-

* I have described the rocks of this Point in a paper on the geology of the valley of the Johore river, including the estuary and its islands.

† The Johore valley however extends much farther inland, but deviating to the westward.

‡ That of Gunong Pántí, consisting of Gunong Gáong, G. Pántí, G. Pilippá, B. Koáyá, and B. Besísé. This chain is visible at the eastward of Singapore from Pulo Tùkong, and as we proceed up the noble estuary of the Johore river it is seen rising over its upper extremity, stretching athwart the valley for about seven miles, and thus concealing the higher and more central range of Blumut, Pinyábong, Bulan &c. A good view of it may be obtained from the more elevated hills of Singapore, such as Bukit Timáh and mount Faber, when the state of the atmosphere allows it to be seen.

§ I went up the largest of these, Sungie Libbam, for 4½ hours on the 22d of last month (August) and found it to be, as far as I proceeded, a branch of the sea more than a river. It receives several streams principally from the northward, such as the S. Láyu extending to behind Johore Lámá, S. Saminchu, and a large branch or creek, S. Pápán. It then proceeds E. and N.E. The larger of the streams that fall into its upper part are the Chimárang, Chimágá and Libbam, which last gives its name to the estuary. The south western part of the peninsula must have presented a very irregular outline before the mangrove forests were formed. Considerable creeks penetrate it on both sides of Gunong Bau.

lo Ubin. Tánjong Penyuso (Point Romania) is the S.E. point of a bold rocky promontory, and the numerous rocky islets, reefs and rocks off it, are probably vestiges of the greater extension to the southward which it anciently possessed. The rock of which the promontory and these remnants are composed appears to be entirely plutonic.* I did not land to examine it, Mr. Thomson having previously given me specimens which he had collected, and the uniformity of its aspect and apparent identity in character with the some parts of Pulo Ubin, leaving little room for doubt as to its mineral constituents. From the N.E. point of the promontory, Tánjong Sippong, a long flat sandy beach, called Teloh Ayer Rámbut, curves northward with beautiful regularity to another rocky point, Tánjong Pungái. Fresh water streams enter the sea at each extremity of this Teloh. The mouth of the northern one, Sungie Pungái, is said to be deep. Tánjong Pungái has a remarkable appearance, from the beach at the foot of the cliff being completely covered by large rounded blocks, consisting chiefly of hydrous peroxide of iron, and gleaming in the sun like so many gigantic balls of polished metal. I landed on the sandy beach north of the point and remained some time examining these curious rocks, but to save those readers of the Journal who do not take an interest in geology, the trouble of reading the notes of my observations, I have placed them in a separate paper.*

From T. Pungái to the northern extremity of the promontory, T. Kináwár, the ground is low and flat. The tides rise over the sandy beach up to the roots of the trees and shrubs which grow luxuriantly in the flat, forming a band of rich and various vegetation. The buáh butá grow in a continuous fringe in front. Old picturesque pínágá and pudé trees abound; and here and there clumps of the páku, a small and elegant palm, not more than three to four feet high, fill the open spaces beneath the spreading branches of the trees. The kámpá and putat are also common. It is worth a Singaporean's while to give a day to visit such a beach as this, for there is nothing like it within the Straits. Accustomed there to a salt water view hemmed in on all sides by islands, and with the beauty possessing the confinement of a lake, there is something indefinably exhilirating in once more fronting real sea waves rolling in from the horizon. The scene however is not without its saddening aspect.

* It varies from granite to wacke. The latter may however be a metamorphosed sedimentary clay.

† See *post*, Notices of the Geology of the East Coast of Johore.

Within 28 miles of a vigorous and populous British settlement, and at the entrance of a strait through which about 1500 vessels annually pass, the eye may search all around for a single hut, in vain. Perfect solitude rests both on the sea and jungle. Not a single fisherman's sampan is to be seen afloat, not a single cocoanut tree rising along the beach. Last century, when Johore was still a place of some trade and strength, this coast is said to have been inhabited, but the kingdom has long been without the energy to resist piratical attacks on parts of its shore much less exposed than this. If a hut were now made here, every inmate would be carried off by pirates within a year, and sold into slavery. Native vessels are frequently attacked, and although the steamer and gun boats, which are from time to time sent from Singapore to cruize here, have undoubtedly served as a considerable protection to trade, the coast will not be safe until a permanent guard is stationed in the neighbourhood. The locality is also notorious for dangers of another kind, for scarcely a year passes without shipwrecks taking place. It is only lately that a careful survey of the entrance into the Strait has been made. Several new dangers have been discovered and laid down by Captain Congalton and Mr. Thomson, but it is to be feared that others remain undetected. The erection of the long contemplated lighthouse can alone give security to navigation, and prevent pirates from resorting to the vicinity.

Tánjong Kináwár is not elevated like Tánjong Pungái. The hill that originally stood here has been ground down by the sea to its foundations. These cover a considerable space in front of the beach, and some singular remains rise like high walls out of the low open jungle that is scattered over the sandy flat of the point. These remnants of the skeleton of the hill prove, on closer examination, to be as curious in their composition as in their shape. At some places they appear to be formed of reddish brown wood in a state of decay, and I believe that similar rocks along this coast have been mistaken for fossil wood.*

We anchored for the night between Tánjong Kináwár and the next prominent point to the north, Tánjong Lompátán. Between this point are Lábuán Moroh, Tánjong Bátu Belobáng, Teloh Pádáng Moloh, and Teloh Mirtáng.

9th. September.—This morning I landed on the sandy beach to the south of Tánjong Lompátán. The jungle here is very luxuriant. Near the place where I landed there was an empty wood

* See Notices of the Geology of this coast, *post*.

cutters hut beneath a spreading tree. Some fine logs of Bintángor, a tree in much repute for masts, lay on the beach. At the point there is a small sandy peninsula covered with vegetation which must be insulated at high water. The Malays say the name is derived from this, the point having leaped *(lompát)* into the sea. On these beaches I collected a number of shells, but when I separated from the gunboat the mat work boxes containing them were mixed with others containing rocks, and the shells were consequently broken. The large shell of a kind of crab was very abundant. The Malays say that the tiger preys upon it, but I had no means of judging whether this is fact or fable.*

From T. Lompátán to T. Mantígí the coast is a succession of long sandy curves, broken occasionally by low rocks. At Tánjong Báláu or Bulo it is more elevated than elsewhere. Between this Point and T. Mantígí are Sungei Tingár and its Teloh, Tánjong Klísá, Teloh Lundáng Bákáu and Teloh Lundáng Wy in which there is a well called Ayér Chá. The name does not speak favorably for the water. Between T. Klísá and T. Mantígí many rocks project from the beach. Tánjong Mantígí is a projecting promontory, with rocky extremities as usual, and smaller rocks scattered along the sandy beach between the points. On rounding it the coast is seen to retire in a southerly direction thus forming a sharp angle with the N.E. face. Within, a second point advances, on the northern side of which is the mouth of the Sídíli Kichí. These points appear to be the extremities of short parallel hill ranges. When we round the promontory of Mantígí the coast assumes a new character. Hitherto it has been quite open and exposed and consequently free from mangroves. Between Mantígí and the next point to the north, T. Tabal, the coast retires, forming the small and shallow bay of Sídílí, so called from the two rivers of that name, (Sungei Sídílí Kichí and S. Sídílí Bésár,) which enter it at its northern and southern angles. The north and south sides of this bay are rocky; the back is a long flat

* Subsequently to this voyage I discovered, on the N.E. point of Báttám and within the Singapore Strait on Pulo Sambo, numerous fragments of pumice so much resembling some kinds of decayed coral until examined closely, that I have no doubt I have frequently passed it unnoticed on other beaches. The Malays, who call it *Bátu timbul* (floating stone,) say that it is found floating in the China Sea and scattered over the beaches of the eastern coast of Johore. I thought it might have been derived from the great Tomboro eruption, but M. Zollinger, who lately visited Sambáwá, informed me that the Tomboro pumice is blackish, whereas this is whitish, and that the currents could not have brought it here. It is probably therefore of Philippine origin.

sandy beach, from which low rocks frequently protrude, and which is the seaward face of an alluvial plain that extends far inland. In the afternoon we entered the bight. As we proceeded, rocks were seen extending a long way out from T. Tabal. The water gradually shoaled from 6 to 2 fathoms until we arrived within the line of rocks, when, none of the Malays on board being sufficiently acquainted with the locality, it was found necessary to anchor and send the sámpán ahead, to sound for the channel leading into the river. We had not been anchored long when the cable suddenly snapt, and we commenced rapidly drifting out. The men immediately took to the oars and pulled towards the place where we had been anchored, but the tide ran out with such strength that we continued to lose ground. The Seráng now returned in the sampan in great consternation, for it appeared the gun boat only carried one anchor. I proposed that we should send the sámpán in to get a pilot. The Jarágán, although desirous of returning at once to Tánjong Lompátán where he said he had seen a piece of wood that seemed adapted for an anchor, at last consented, and the sámpán was despatched into the river, while we hoisted sail and stood out to avoid the risk of being caught by a squall between the rocks and the beach. We stood of and on, impatiently waiting the return of the sámpán, till it became dark, when we were obliged to keep to the southward of T. Mantígí, and at a greater distance from the shore. Hour after hour passed, and the whole night wore through watching for the sámpán in vain.

(To be continued)

NOTICES OF THE GEOLOGY OF THE EAST COAST OF JOHORE.

In the Journal of my voyage along this coast* I have mentioned that Tánjong Pungái is the first point to the north after passing Point Romaniá. It is the seaward extremity of a low hill range worn by the waves into a sharp ridge, and presenting on the side at present exposed to the action of the sea, a cliff rising over a beach which is covered with rounded blocks, mostly with smooth blackish brown surfaces. The greater number have a strongly shining lustre, between metallic and pitchy, and these consist, in large measure, of hydrous peroxide of iron, at least at and near the surface. Having in almost every development of lateritic and other ferruginous rocks which I had previously examined on the southern and western coasts of the Peninsula, detected some traces of their having previously existed as common sedimentary strata, and from this, combined with the mode in which the plutonic rocks occur, ascertained, beyond all doubt, the real origin of laterite,† and deduced a general hypothesis for the Peninsula,‡ it was satisfactory to find the first point on the eastern coast offering a test of a new and strikingly beautiful character. At first sight nothing presented itself but the cyclopean pavement of black shining blocks of ore. On walking across these, or rather leaping and climbing from block to block, and carefully examining each of them, I soon found some which, instead of consisting altogether of the black ore, had foliated talcose patches, well baked and running into it; and, what removed all doubt, the fresh rock of the beach on which the blocks rest, was, in several places, exposed between them. It consists of a talcose sandstone, more or less distinctly foliated as the minute talc plates are abundant or the reverse, and running N.W. $\frac{1}{2}$ W.. S.E. $\frac{1}{2}$ E. in layers nearly vertical but with a slight N. Easterly dip. In some places it is so little affected by the iron as scarcely to be distinguished from a common soft unaltered sandstone. At other places it is minutely reticulated with veins of iron ore, and it is also frequently entirely converted into quartz. In some places the talc is seen preserved in films in the middle of the quartz, and the quartz in foliæ alternating with unaltered foliæ, in the same way as at Tánjong Tuán (Cape Rachado) on

* Preceding article p. 621.

† See Journal of the Asiatic Society of Bengal for July 1847 p. 679.

‡ See a general explanation of this in a *Sketch of the Physical Geography and Geology of the Malay Peninsula*, ante p. 96–100.

tho west coast of the Malay Peninsula. Sometimes the rock, without losing entirely its original structure, aspect and colour, has become hard and crystalline, while parts seem to be, as it were, upon the verge of becoming wholly quartzose. Occasionally the rock is entirely talcose. The blocks, from their shapes and structure, and the manner in which the partially altered sandstone occurs in many of them, have evidently been portions of highly ironmasked bands. Many are columnar and vesicular,—the lateral walls of the vesicles being in the direction of the columns and the terminal ones at right angles to it, as in the wood of trees. The same structure is assumed by the iron veins in the little altered rock. The columnar structure itself coincides with, and has been induced by, the direction of the layers of the original rock, or the laminæ of deposition, as in many of the tubular varieties of the laterites of Malacca. Some of the surfaces are dull brownish and reddish brown, but in general they are black, highly polished, shining, and sometimes iridescent. Amongst the blocks were some which had a curious and beautiful appearance. The ordinary bright, smooth, metallic surface was interrupted, and succeeded by a dull fibrous structure resembling decayed wood, which in some places, by becoming coarser and two perpendicular systems of plates interlacing, changed into honeycomb. The walls of the vesicles or tubes, in the latter case, were composed of the shining ore, and the bottoms, of the unaltered or only slightly indurated sandstone. Larger cavities shewed sandstone in the bottom, intersected by numerous fine parallel iron seams. The honeycomb structure is therefore acquired here by the washing out of the sandstone between these seams. Some entire blocks had a minutely fibrous structure, and, if seen without the light thrown on them by the surrounding phenomena, must have been mistaken for pieces of fossil trees, until they had been broken into. In the hearts of some of them I found the original sandstoue isolated in patches amongst the iron ore.

Here and there small masses of solid quartz occurred.

The ore itself is internally dull, blackish, compact, with small, irregular, scattered vesicles. A stanhope shews quartz particles, apparently of the original sandstone, scattered through it, and at some spots regular quartz crystals and minute radiated crystals of the ore.

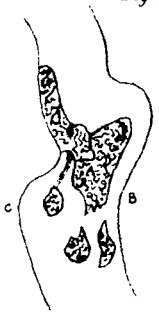
Proceeding S.E. $\frac{1}{2}$ E., ledges of half altered grey sandstone appeared. These in some places were sinuous, a very common effect of the plutonic action to which the Peninsula has been subjected.

On the outer margin of the beach rounded fragments from 6 inches to 2 feet in diameter were strewed.

At the seaward extremity of the point the strata were well displayed. Layers of quartz abounded, not continuous, but shewing themselves here and there between the layers of talcose sandstone and occasionaliy crossing them. In general they deflected or distorted the latter in a greater or less measure, as in fig. 1.

A, is white quartz in a layer of grey talcose sandstone, which has been partly reduced into the quartz and distorted along with the adjacent layers B and C. The faces of these layers next the quartz were highly ferruginous.

Fig 1



The quartz was also frequently seen entangled as it were amongst the sandstone in lumps and in films and seams. Many amorphous lumps were completely isolated in the sandstone. From the face of the cliff behind, huge masses of highly ironmasked rock project. From the tops of some of these the trunks of trees rose, and the roots spread over the bare rock and into holes and crevices. Along the bottom of the cliff were many large blocks which had fallen down. Some were 30 feet long, and from 15 to 24 feet broad and high. They were completely ironmasked, in fact masses of iron ore. Some had a lateritic aspect and structure, strongly resembling the hardest varieties of the laterites of Malacca, such as some of those of Pulo Upé.

I now ascended the hillock, the abraded face of which forms the cliff, and which has furnished all the blocks that pave the beach. The south side, by which I mounted to the narrow summit, is very steep; the north side is also steep, and although covered with vegetation, has at one time been exposed to the action of the waves, as is shewn by the projecting rocks and a cove at its foot filled with sea sand now overgrown with plants.

The flat between T. Pungái and T. Kináwár has been filled up with sand driven in and piled by the waves only a little above the level of the sea. The rock protruding occasionally through the sand is similar to that at the point. At one place the sand had been washed away and exposed a conglomerate possessing a considerable degree of consistency, but evidently formed in situ, as it contained fragments of the local quartzose and ironmasked rocks. The

cementing substance appeared to be the lime derived from the shells and debris of shells which it contained. In the sand of the beach many large blocks of coral are imbedded. Half way to T. Kínáwár a low ledge of rock crosses the beach. In this the quartz pervades the talcose base in a manner very like the analogous altered rocks at T. Tuan (Cape Rachado.) Here it is in isolated lumps, there in laminæ between the talcose laminæ, and terminating abruptly. Everywhere, or almost everywhere, it is accompanied by a curious twisting in the layers of the original rock. Further on a solid irregular mass of quartz about 5 feet square projects.

Tánjong Kináwár differs greatly in its aspect from T. Pungaí. The original rock has been similar but finer and more clayey, with the colour more blue and in some places blackish and reddish. The ferruginous action has been much less powerful; the projecting hill has consequently been worn to the level of the sea, and no great ironmasked blocks strew the ground. The sandy beach is indeed continued round the point, but when we reach it the vegetation advances, some remnants of the strata rise amongst it, and rows of ledges very irregular in their height stretch in front into the sea. The strata here are nearly vertical, so that the portions left standing amidst the low trees and shrubs appear like the walls of a ruin, some being only about a foot in thickness, while they rise to the height of 20 to 30 feet. They are much and irregularly seamed with quartz. Many parts have a strong resemblance to decayed wood. This arises from the dry hardened aspect of the rock, the fineness of the laminæ, and the manner in which they are exposed by unequal wasting, so as to present all the varieties of grain which a piece of wood does. Towards the extremity of the point where the ledges run out, the quartz is abundantly developed, and I have seen no place where its mode of production and its effects can be better studied. My inspection was only partial, as I intended, if time allowed, to revisit and fully examine it on my return. The rock is a highly talcose fine grained shale, varying in colour from chocolate to violet (but sometimes also bluish, and greyish,) the foliæ very fine and having a glisening lustre on their faces; the cross fracture is darker in colour and dull; the less indurated portions give a streak like chalk. Wherever there is much quartz the layers and laminæ are greatly deflected. This effect is seen both on the thick beds, amongst and through which quartz is developed, often on a large scale, and on the fine laminæ which include films of quartz or are traversed by it in thin cross veins.

T. Pungaí and T. Kináwár are the extremities of the same hill range bifurcated in the usual manner, and the great difference in the aspect of the two points arises entirely from the difference in the degree of the plutonic influence to which they have been subjected. At the former, ferruginous emissions have predominated. Hence the masses of black and shining hydrous iron ores and less ironmasked rock. At the latter, the rock has merely been seamed, and at particular places saturated, with siliceous exhalations only slightly ferruginous, which have made it hard and tough, and enabled the more indurated portions to resist the abrasion of the sea. When a portion of the ironmasked Pungái rock falls down, it remains almost indestructable, while fragments of the Kináwár ledges are soon broken up. To complete the contrast, at Pungái the direction of the Point itself coincides with the strike of the strata, at Kináwár the two lines are transverse to each other.

Tánjong Lompátán.

The rock to the south of the Point, where seen, was a very micaceous or talcose* shale. At one spot there were numerous ironmasked blocks similar in appearance to those at T. Pungái. Some which externally were brownish black, smooth and glossy offered when fragments were broken, the appearance of a coralline structure. These I find on examination to be clearly ironmasked coral, and it must have been such specimens that Dr. Bland described as burnt coral and considered as an evidence of volcanic action. A few years ago I should without hesitation have come to the same conclusion, for the appearance of these blocks is precisely that of masses of slag. But the transformations which the oxidation of iron effects in all rocks of the Peninsula in which it abounds are so great, and frequently so entirely assimilate them in appearance to volcanic scoriæ† that it is necessary to separate altogether the question, how the rocks acquired this volcanic aspect, from the enquiry, how the cause of this change was itself introduced. To the first, the presence of iron in the rock and its oxidation, seem, in most cases, to be the true an-

* My specimens are mislaid or lost.

† Laterite has this other characteristic in common with volcanic rocks that it sometimes appears isolated and overlying sedimentary strata, owing to the vapours and currents which produced it having most readily ascended through fissures, and diffused themselves where the rock was most porous or most saturated with water.

swer. To the second, the answer can only be derived from a careful mineralogical and geological examination of each locality. In the southern part of the Peninsula, it will be found that the iron has in most cases been acquired from beneath, but in what precise condition originally it is hardly possible in any case to ascertain. Because, wherever it is visible, it has long been at or near the surface of the earth, and, in whatever state of combination it first entered the rock, we now only see it highly oxidised.* There is often clear evidence of its having ascended into them in a state of great rarity or of sublimation, for in such cases the alterations effected, while evincing the presence of great heat, are totally different from those that are occasioned by the eruption of dense molten rock. Electrical currents have also left most distinct traces of their agency in diffusing it. Great disturbance of the strata, fracture, flexure and twisting of laminæ and layers, and conversion of the rock into crystallised quartz, have often accompanied its introduction. The mechanical changes that have been effected in the stratified rocks having directed us to the plutonic basis on which we believe they rest, because it rises through them in all directions, we find it is not only frequently highly ferruginous in its composition, but is sometimes traversed by ferruginous dykes, which, towards the surface, present the same appearances as the more completely ironmasked strata. Lastly, a careful examination of these dykes, and of the composition and structure of the rock adjoining them, proves that, although oxidation has since supervened, they were formed contemporaneously with the mass in which they occur, and thus we are led by strict induction to the conclusion that the elevation, breaking and bending of the strata, and the greater part of the quartzose, lateritic and other ferruginous changes which they have undergone, had a simple and single origin—the same which produced the plutonic mass of the Peninsula. The mechanical force of its intumescence gave rise to the one series of changes, and the electrical and chemical action which attended it to the other. But it would be entirely to supersede observation by theory, if we directly attributed every example of ironmasked rock which we find to this plutonic influence.

* The decomposition of iron pyrites, and the diffusion of the iron in solution, produce a lateritic rock (*Ante* vol. I. p. 166.) A similar effect will follow from the decomposition of any other mineral containing a sufficient quantity of iron. The rocks containing such minerals in abundance will always retain a lateriticcharacter from the surface to a certain depth.

Cases often occur where, from the want of a combination of phenomena, we cannot advance beyond an answer to the first of the two questions which I have said are necessarily raised by every iron-masked rock. The isolated masses of coral observed by Dr. Bland and myself appear to be such cases. I cannot say that these corals were not contemporary with the emission of the plutonic vapours which stratified rocks on this coast, like others on all the coasts of Johore, have imbibed. All I can venture to say is that they have been saturated with iron in a state of solution or of vapour, which has become highly oxidised. Considering that I nowhere saw any coral in the strata along this coast, that the rocks of which it is composed are not calcareous, and that no fossils of any kind have yet been found in Johore, the probability is that the corals are modern, and that the iron was derived from rocks that formerly rose above the beach. In numerous localities along the southern shores of the Peninsula and the adjacent islands, ironmasked sandstone and conglomerate are at present forming beneath the surface of the beach, by the percolation of water from ferruginous cliffs. On the eastern bank of the estuary of the Johore the same effect is produced by the water of a fresh water marsh draining through its porous margin of sand and saturating the sand of the beach, and the same process on a smaller scale is seen in many other places. In these cases the iron is of animal origin.

Advancing towards the Point, a few ledges, ironmasked and with included quartz, were passed. One of these near the point is highly silicified and compact, but portions of the talcose shale occur in it. The dip here is about 45° towards the N.W., the strike N.E.. . S. W. Near the Point the quartz veins are very irregular both in size and direction. Sometimes several occur parallel to each other and at right angles to the strike. The strike varies, for at one place it was E. by S.. . W. by N. The dip was also much greater here, approaching nearly to vertical.

(To be continued)

A CONTRIBUTION TO THE KNOWLEDGE OF THE ICHTHYOLOGICAL FAUNA OF SUMBAWA.

By Dr. BLEEKER.

Chir. Maj., Besturend Lid en Secretaris v. h. Bat. Gen. v. K. en W., Lid v. h. Amsterd. Genees. en Heelk. Gen., v. d. Maatsh. v. Nederl. Letterk. te Leiden, v. h. Natuurk. Gen. te Groningen &c. &c.

The meritorious naturalist traveller H. Zollinger, had the goodness, during his residence at *Bima* on the island of *Sumbawa*, to collect for me a great many kinds of fishes. To the collection thus brought together by that learned person, this account is indebted for its origin.

Sumbawa was until this time totally unknown in an ichthyological point of view. Science is thus under new obligations to my friend Zollinger. The natural history of Netherlands India expected from him yet greater advances, but peculiar circumstances caused his return Europe: the sense of his merits and my esteem and friendship for him, induce me to dedicate to him one of the yet undescribed species of fishes which he collected.

The fishes enumerated below were all taken in the sea at Bimá. They naturally form but a small portion of the Ichthyological Fauna of Sumbáwá. As a first contribution to the knowledge of this Fauna what follows will not be without value.

The species of the collection are 47 in number, and belong to 35 genera and 19 families. They are as follows:

PERCOIDEI,..... * Lates nobilis C. V.
* Therapon servus C. V.
Ambassis nalua C. V.
Apogon multitæniatus Ehr. C. V.?
„ melas Blkr.
* „ thermalis C. V.
* Serranus crapao C. V.
* „ pardalis Blkr.
Mesoprion erythropterus C. V.?

		Holocentrum sammara C. V. ?
	*	Sillago acuta C. V.
Scleroparei,	*	Pterois volitans C. V.
		Apistus Zollingeri Blkr.
Sciænoidei,	*	Pristipoma kaakan C. V.
	*	Scolopsides lycogenis C. V.
		Heterognathodon bifasciatus Blkr.
Sparoidei,	*	Chrysophrys calamara C. V.
	*	Cæsio erythrogaster C. V.
Chætodontoidei,		Chætodon vagabundus C. V.
		„ sebæ C. V.
	*	„ octofasciatus C. V.
	*	Heniochus macrolepidotus C. V.
	*	Platax Leschenaldi C. V.
	*	Toxotes jaculator C. V.
Scomberoidei,	*	Caranx xanthopygus C. V.
	*	Equula caballa C. V.
Theutides,		Amphacanthus margaritiferus C. V.
Mugiloidei,		Mugil Dussimieri C. V. ?
		Atherina bimanensis Blkr.
Gobioidei,		Gobius quinquethigatus C. V.
		„ erythrophaios Blkr.
Labroidei Ctenoidei,		Pomacentrus vanicolensis C. V.
	*	„ fasciatus C. V.
		Pristotis trifasciatus Blkr.
		„ violascens Blkr.
		Dascyllus aruanus C. V.
	*	Glyphisodon bengalensis C. V.
		Heliases lepisurus C. V.
Labroidei Cycloidei,	*	Julis (Halichœres) modestus Blkr.
		Scarus sumbawensis Blkr.
Clupeoidei,		Alosa brevis Blkr.
Aulostomato,		Amphisile scutatus Cuv.
Gymnodonta,		Tetraodon papua Blkr.
Balistini,	*	Balistes aculeatus Bloch. Cuv.
		Aleuteres lævis Cuv.
Ostraciones,		Ostracion cubicus Bloch. Cuv.
		„ valentini Blkr.

Of the 47 species, the 21 marked with a * belong to the Fauna of

Java, beirg thus about one half; 10 are new to science; the rest doubtful.

One species I have considered it necessary to place in a new genus, which I had previously established in 1844, but of which I have not yet published the characters. It is a genus of Sciænoiedes, which, related to the Scolopsides, is chiefly distinguished from them by the presence of 4 tusks in the upper and 2 in the under jaw, as well as by the non-thorned or thorn formed extremities of the os suborbitale. In my Contributions to the Medical Topography of Batavia I have named the first species of the genus discovered by me, *Heterodon zonatus*, which name I afterwards changed into *Heterognathodon xanthopleura*, as more descriptive of the genus and species. *Heterognathodon bifasciatus* of Bimá is the second species belonging to this new genus, but I believe it is the same species as Scolopsides caninus Cuv. Val. which is given in the celebrated Historie naturelle des Poissons at the end of the list of the species of Scolopsides.

Of some of the species already known to science I have drawn up new diagnoses, even as I have done of some doubtful species. I must still lament that, from my unavoidable separation from the scientific world, I am not in a condition to lithograph the new species. I must await my return to Europe to publish my already partly completed Fauna Archipelagi Indici Ichthyologica. The efforts made by me with the government of Netherland's India for its publication have not only not been attended with the desired result, but, followed by a transference from Batáviá to Sámáráng and Surábáyá, have placed me even beyond the possibility of applying to the service of ichthyological science my cabinet, collected by the labours of many years and at a great cost. Batavia, but a short time past the centre of science in Netherlands India, shall speedily be so no more. The scientific periodicals, the *Tijdschrift voor Neerlandsch Indie*, the *Natuur en Geneeskundig Archief voor Neerlandsch Indie*, the *Indisch Magazyn*, on whose existence these possessions might pride themselves, have all fallen to the ground. The year 1848 will be noted in the history of Netherlands India as the last year of the decennium of its scientific activity. May the time come when science shall be again protected and supported here against the unfavorable influences which, in the midst of her bloom, have by little and little undermined and menaced her with total destruction.

I have allowed myself the preceeding digression in order to shew why my ichthyological publications are not yet more numerous, and why they are not accompanied by plates of the species discovered by me.

I shall proceed to the diagnostical description of the doubtful, less known and new species.

PERCOIDEI.

Apogon melas Blkr.

Ap. corpore oblongo compresso, dorso elevato, altitudine corporis $3\frac{1}{2}$ in ejus longitudine; capite æque longo ac corpore alto; linea rostro-dorsali rectiuscula; pinnis dorsali 2a rotundata, caudali margine posteriore concava; colore capite, corpore pinnisque omnibus nigro.

D. 8.— 1 | 8 P. 2 | 12 V. 1 | 5 A. 2 | 9 C. 17.

Hab. Bima. Mare.

Apogon multitæniatus Ehr. C. Val. Hist. poiss. ii. p. 118?

Ap. corpore oblongo compresso; dorso elevato; altitudine corporis $3\frac{1}{4}$ in ejus longitudine; capite æque longo ac corpore alto; linea rostro-dorsali leviter convexa; pinnis dorsali 2a rotundata, caudali postice excisa; colore corpore purpurascente, fasciis 10-13 longitudinalibus fuscis, pinnis dorsalibus violaceo, ceteris rufis.

D. 7.—1 | 10 P. 1 | 12 V. 1 | 5. A. 2 | 9 C. 17 et later.

Hab. Bima. Mare.

Apogon thermalis Cuv. Val. Hist. Poiss. iii. p. 363?

Ap. corpore oblongo compresso, dorso elevato, altitudine corporis $3\frac{1}{4}$ ad $3\frac{1}{3}$ in ejus longitudine; capite æque longo ac corpore alto; linea rostro-dorsali infra concàvà, supra convèxà; pinnis dorsali 2a rotundata, caudali leviter excisa, lobis latis; colore capite, corpore pinnisque flavescente-hyalino, membrana spinam dorsalem 2m. inter et 3m. nigro, cauda latere macula rotunda nigra.

D. 6—1 | 10 P. 2 | 12 V. 1 | 5 A. 2-9 C. 17 et later.

Hab. Bima. Mare.

Serranus pardalis Blkr.

Serr. corpore elongato compresso, altitudine 4 in ejus longitudine, capite obtuso $3\frac{1}{2}$ in corporis longitudine; fronte humili, linea frontali convexa; dentibus caninis in maxilla superiore 2; præoperculo angulato, parte inferiore marginis posterioris dentibus aliquot superioribus majoribus; spinis opercularibus crassis 3; oculo diametro 4 in longitudine capitis; squamis parvis; pinnis rotundatis, caudali integra postice convexa, pectoralibus 4 in longitudine corporis: colore corpore pinnisque rufescente, maculis fuscis magnis, fere contiguis, dorso hexagonis, lateribus ventroque pinnisque omnibus rotundatis; pinna pectorali basi fasciis 2 fucis, apice nigrescente.

D. 11 | 18. P. 2 | 15 V. 1 | 5 A. 3. | 9 C. 17.

Hab. Bima. Batavia. Mare.

Species *Serranus faveatus* C. Val. l. c. ii. p. 245 maxime affinis, sed numero radiorum distincta.

Mesoprion erythropterus C. V. l. c. ii. p. 362?

Mes. corpore oblongo elevato, altitudine $3\frac{1}{5}$ in ejus longitudine; capite acuto 3 in longitudine corporis; linea rostro-frontali recta; dentibus caninis 2 in maxilla superiore, dentibus pluribus majoribus in maxilla inferiore; osse suborbitali humiliore: præoperculo margine posteriore leviter ex-

ciso; oculo diametro 3½ in capitis longitudine; pinnis dorsali et anali rotundatis, caudali integra angulata postici convexa; colore supra purpurascente infra flavescente, maculis basibus squamarum obscurioribus, pinnis purpurascente.

D. 11 | 14 A. 3 | 9 P. 2 | 14 V. 1 | 5 C. 17 et later.

Syn. *Lutjanus erythropterus* Bloch. pl. 249?

Hab. Bima. Mare.

Holocentrum sammara C. V. l. c. iii. p. 161?

Hol. corpore oblongo compresso, altitudine 4 fere in ejus longitudine, capite acuto 3½ in longitudine corporis; lineis rostrodorsali convexa, intramaxillari ventrali recta; dentibus orbitalibus et opercularibus numerosis, suborbitalibus magnis; spinis operculaibus inaequalibus, praeoperculari mediocri, operculi limbum vix superante; oculo magno 2½ in longitudine capitis; lateribus verticis striis 8-10 divergentibus; spinis dorsi mediocribus; pinna caudali profunde divisa lobis rotundatis; colore dorso violascente, lateribus ventreque ex roseo argenteo, vittis longitudinalibus fuscis 8-10; pinnis pectoralibus, anali et caudali ex rosaceo flavescente, ventralibus albo; macula nigra magna spinas dorsales 1m inter et 4m; pinnis dorsali et anali radiosis margine inferiore, caudali lateribus violaceo; genis argenteo, guttis pluribus nigris; operculis nigrescente.

D. 10—1 | 12 P. 1 | 13, V. 1 | 7, A. 4 | 9, C. 19, et later brev.

Syn. *Schouwerdick. Renard* Poiss. I f. 156?
Sciaena Sammara Forsk.?
Labrus angulosus Lacep. Poiss. III p. 430.
Holocentrum Samara Rupp. Fisch d. roth. Meers. pl. 22 f. 3?
Holocentrum Christianum Ehr. C. V. Poiss. iii. p. 162?

Hab. Bima. Mare.

Diagnosis amplior propter speciei incertitudinem.

SCLEROPAREI.

Apistus Zollingeri Blkr.

Ap. corpore oblongo, altitudine 3½ in ejus longitudine, capite 3½ in longitudine corporis; spinis suborbitalibus 2, praeopercularibus 4, cirris nullis; squamis fere inconspicuis; radio pectorali libro nullo; pinna dorsali spinosa in 2 partes divisa, parte anteriore trispinosa, paulum post oculos incipiente, pinna caudali integra postice convexa; colore corpore pinnisque fusco nigro nebulato et variegato.

D. 14 | 7, P. 1 | 11, V. 1 | 5. A. 3 | 6. C. 12.

Hab. Bima. Mare.

Species habitu *Apistus trachinoides* C. V. affinis sed sat distinctor. Nomen dedi in honorem amicissimi *Henrici Zollingeri*, naturae tropicae indefessi perscrutatoris.

SCIAENOIDEI.

HETEROGNATHODON Blkr.

Pinna dorsi unica. Membrana branchiostega radiis 5. Pinna pectoralis radiis fissis. Ossa suborbitalia glabra. Praeoperculum dentatum. Dentes maxillares superiores setacei, pluriseriata, caninis anticis 4; inferiores antici setacei pluriseriati, caninis 2 curvatis, postici conici uniseriati.

Syn. *Heterodon* Blkr. Bydr. t. d. geneesk. Topograph. v. Batavia.

Heterognathodon bifasciatus, Blkr.

Het. corpore oblongo compresso altitudine 5 in ejus longitudine; capite 4 in longitudine corporis, rostro convexo; ossibus suborbitalibus edentulis: praeoperculo rotundato; spina operculari plana unica brevi

ossibus maxillaribus superioribus denticulatis; pinna caudali po tice concava; colore dorso lateribusque caerulescente, vittis 2 longitudinalibus margaritaceis, 1*a* oculum inter et radio dorsali postico, 2*a* rostrum inter et basin pinnae caudalis; ventre pinnisque flavo.

D. 10 | 10, P. 1 | 14, V. 1 | 5, A. 3 | 7. C. 17.

Syn. *Scolopsides caninus* C. V. l. c. v. p. 256?

Hab. Bima. Mare.

MUGILOIDEI.

Mugil Dussumieri C. V. l. c. xi. p. 109?

Mug. corpore gracili compresso; linea rostro dorsali obliqua subrecta; capite acuto aeque alto ac longo, 5 in longitudine corporis; latitudine capitis 1½ in ejus longitudine; oculis diametro 4 in capitis longitudine, velo adiposo orbitali oculos non tegente; rostro acuto, maxilla superiore inferiore longiore; ossibus suborbitalibus dentatis; labio superiore mediocri non cirrato; pinnis dorsali 1*a* spinis validis, 2*a* et anali angulatis, corpore multo humilioribus, radiis non productis; pinnis pectoralibus capite brevioribus, 7 in longitudine totius corporis; caudali margine posteriore leviter concava; appendice pinnae dorsi lae squamosa longa; squamis mediocribus carinatis, carinis singilis seriebus squamarum longitudinalibus contiguis, lineas longitudinales parallelas 8 vel 9 constituentibus; colore copore ex flavescente argenteo, pinnis flavescente.

D. 4—1 | 8, P. 1 | 13, V. 1 | 5, A. 3 | 9, C. 14 et lat. brev.

Hab. Bima Mare.

Atherina bimanensis Blkr.

Ath. corpore elongato compresso altitudine 6½ in ejus longitudine; capite compresso 4 in longitudine corporis, fronte obliqua, oculis diametro 2½ in longitudine capitis; praeoperculo margine posteriore exciso; squamis magnis; pinna pectorali 5 in longitudine corporis, acuminata; pinna dorsali 1 *a* medio pinnas ventrales inter et analem; colore corpore ex flavescente argenteo, guttis lateribus pluribus nigris, seriatis; pinnis flavescente, basi pinnae pectoralis stria nigra.

D. 5—1 | 7. P. 1 | 13, V. 1 | 5, A. 1 | 9, C. 14 et later.

Hab. Bima. Mare.

GOBIOIDEI.

Gobius erythrophaios Blkr. Diagn. vide in *conspect. Gobioideorum Archip. Sunda-molucc.*

LABROIDEI CTENOIDEI.

PRISTOTIS Rupp. Neue wirbelth. Fisch. roth. M. p. 128.

Pristotis violascens Blkr.

Prist. corpore oblongo compresso, altitudine 3½ in ejus longitudine dorso et ventre convexis; capite 4 ½ in longitudine corporis; praeoperculo subrectangulo; pinnis dorsali an alique rotundatis, caudali margine posteriore concava; angulis rotundata colore corpore violascente, pinnis pectoralibus ventralibusque dilutiore, macula nigra ad basin pinnae pectoralis.

D. 13 | 11, P. 2 | 16, V. 1 | 5, A. 2 | 11, C. 17 et later.

Hab. Bima. Mare.

Pristotis trifasciatus Blkr.

Prist. corpore oblongo compresso, altitudine 3½ in ejus longitudine; dorso convexo, ventre subrecto; capite 4½ in longitudine corporis; praeoperculo subrectangulo; pinnis pectorali radio primo in filum producto, dorsali analique acutis, caudali biloba, radiis 2 productis; colore corpore virides-

cente, vittis 3 nigris latis verticalibus, 1*a* oculari, 2*a* spinas dorsales anteriores inter et pinnas pectorales, 3*a* in parte posteriore pinnae dorsalis spinosae et parte anteriore pinnae dorsalis radiosae.

D. 13 | 10, P. 1 | 14, V. 1 | 5, A. 2 | 12, C. 17 et later.

Hab. Bima. Mare.

LABROIDEI CYCLOIDEI.

Julis (Halichoeres) modestus Blkr. overz. Batav. Gladschubb Labroid. p. 26. var. Pinnis omnibus aurantiacis, dorsali analique maculis numerosis rubris.

Hab. Bima Mare.

Scarus sumbawensis Blkr.

Scar. corpore oblongo compresso, altitudine $3\frac{1}{4}$ in ejus longitudine; capite obtusiusculo, 4 fere in longitudine corporis; fronte convexa non prominente; maxillis roseis denudatis glabris leviter crenulates, dentibus angularibus nullis; linea laterali ramosa; pinna caudali margine posteriore convexa, radiis externis prominentibus; colore corpore viridi, capite dorsoque profundiore, marginibus squamarum rubro, fasciis capite lateribusque nullis; pinnis pectoralibus et ventralibus aurantiaco, dorsali analique rubescente violaceo marginato, caudali violaceo.

D. 9 | 4, P. 1 | 13, V. 1 | 5, A. 3 | 10, C. 13 et later.

Hab. Bima. Mare.

CLUPEOIDEI.

Alosa brevis Blkr.

Al. corpore oblongo, compresso; altitudine 3 fere in ejus longitudine; capite 4 in longitudine corporis, ore edentulo; maxilla superiore inferiore longiore; oculo diametro 3 in capitis longitudine, dorso ventreque convexis, ventre cultrato spinoso, pinna caudali non squamosa, profunde excisa, colore dorso coeruleo, lateribus ventreque flavescente argenteo, pinnis flavo.

B. 5, D. 1 | 17, P. 1 | 16, V. 1 | 7, A. 1 | 17? C. 19 et lat.

Hab. Bima. Mare.

Species habitu *Clupanodon chanpole* Ham. Buch, affinis.

GYMNODONTA.

Tetraodon papua Blkr.

Tetr. corpore irregulari oblongo, compresso, altitudine $2\frac{2}{3}$ in ejus longitudine, dorso et ventre scabris, lateribus et cauda laevibus, capite acuto, rostro prominente, naribus in papillo concavo 2 minimis, fere inconspicuis, linea laterali inconspicua, pinnis dorsali analique rotundatis, pectorali emarginata, caudali postice convexa 4 in longitudine corporis, colore corpore supra profunde fusco, guttis coeruleis, radiis coeruleis circa oculos infra rubro, pinnis rosaceo—flavescente, macula nigra magna, coeruleo limbata sub et ad basin pinnæ dorsalis guttis plurimis coerulescentibus ad pinnam caudalem.

D. 9., P. 16, A. 8, C. 9 et lat. brev.

Syn. *Ikan Papoea d'jantan. Valentyn.* Ind. Amb. iii. p 219.

Hab. Bima. Mare.

BALISTINI.

Balistes aculeatus Bloch Tab. 149.

Bal. corpore ovali compresso, basi caudae seriebus 3 aculeorum armata, serie superiore aculeis 9–11, serie inferiore duplo breviore aculeis 4–5; pinnis caudali postice leviter convexa, pectoralibus, dorsali analique

rotundatis ; linea laterali inconspicua ; colore dorso viridi fuscescente ventre flavescente, vittis oculari-pectoralibus 3 coeruleis maxillari-pectoralibus 2, superiore triangulari aurantiaco, inferiore margaritaceo, lateribus supra pinnas pectorales fusco fasciis 4 obliquis ad anum, nigro sinctum, et ad pinnam analem descendentibus, pinnis dorsali 1*a* fusco, ceteris aurantiaco, labiis flavescente, superiore coeruleo limbata.

D. 3—3 | 21, P. 1 | 12, A. 2 | 20, C. 12.

Syn. Soenoeck. Renard. Poiss. i. f. 154.

Baliste epineux Lacep. i. Tab. 17. f. i.

Balistes aculeatus Cuv. Regne An. ed. luxe, nec Ruppel.

Balistes aculeatus Ruppel (Neve Wirbelth. visch. roth. M. p. 27. Tab. 7. fig. 1.) species affinis sed numero radiorum, seriebus aculeorum, caudalium, coloribusque sat distincto.

Aleuteres laevis Cuv.

Al. corpore oblongo compresso altitudine 4 in ejus longitudine, linea frontali concava, dentibus in singulis maxillis 4, pinna caudali longissima rotundata, $3\frac{1}{5}$ ad $3\frac{1}{4}$ in longitudine totius corporis, radiis pinnarum, caudali excepta, simplicibus, colore corpore rufo viridi maculis sparsis fuscis, labiis nigro, genis pectoreque vittis longitudinalibus coeruleis pinnis dorsali, pectoralibus, analique fuscescente pellucido, caudali nigrescente radiis fuscis.

D. 1 | 44, P. 14, A. 49, C. 1 | 10 | 1.

Syn. *Balistes laevis* Bloch. Tab.

Hab. Bima. Mare.

OSTRACIONES.

Ostracion cubicus L. Bloch Tab. 137 Cuv. Rupp.

Ostr. corpore tetragono, altitudine pyxidis osseae 3 in ejus longitudine spinis frontalibus et analibus nullis, pinnis omnibus rotundatis, linea rostro-frontali concava, scutis granulosis, dorso lateribusque hexagonis, pyxide ventre latiore quam dorso, colore corpore viridi-fuscescente, scutis plurimis dorso lateribusque macula coerulea nigro cincta ; pinnis aurantiaco, genis ventre et pinna caudali maculis nigris.

D. 1 | 8, P. 1 | 9, A. 1 | 8, C. 1 | 7 | 1.

Syn. *Ostracion mouchete* Lac. i. p. 46 fig.

Hab. Bima. Mare.

Ostracion valentini Blkr.

Ostrac. corpore tetragono, altitudine pyxidis osseae $1\frac{2}{3}$ in ejus longitudine, spinis frontalibus et analibus dimidiam pyxidis longitudinem aequantibus ; pinna caudali spinis analibus breviore, colore corpore fuscescente maculis profundioribus infra ad latera, ventre roseo, spinis pinnisque omnibus flavescente.

D. 1 | 8, P. 1 | 9, A. 1 | 8, C. 1 | 8 | 1.

Syn. *Ikan Peti, Valentyn* Ind. Amb. iii. f. 36 !

Ikan Toetombo badoerie, Valentyn, ib. iii. f. 333 ?

Hab. Bima Mare.

Nomen dedi in honorem *Francisci Valentini*, Indiæ orientalis neerlandicae olim historiographi meritissimi.

DR. BLEEKER.

Soerabaya 21 July, 1848.

MISCELLANEOUS NOTICES &c.

NEW PUBLICATION RECEIVED.

1. *The Calcutta Review No. XVIII June*, 1848. (From the Editor) Contents:

Corrie and his Cotemporaries—The Ante-Episcopal Period.
Geology of India.
The Hindi language—Thompson's Dictionary.
The Acts of the Governor-General of India in Council.
The Bengal Artillery.
Major Smyth's History of the Reigning Family of Lahore.
Miscellaneous Critical Notices.

We are glad to see that geology is to receive that share of attention which it deserves, in this excellent periodical which every Englishman in the east ought to read.* The able article on the geology of India in the present number consists of a general introduction to the science, extending over some 30 pages, and a review of a recent work by that talented and indefatigable geologist Captain Newbold, who must be well known to most of our readers by his work on the Straits Settlements. In the course of his remarks the reviewer adverts to the question of the origin of Laterite, which he considers as settled by Captain Newbold's facts. He omits however to inform us what opinion he has derived from these facts. Captain Newbold's numerous papers in the Journal of the Asiatic Society on the Geology of Southern India leave no doubt on our mind that the Indian laterites have the same origin as those of the Malay Peninsula, the majority of which are nothing but sedimentary rocks, more or less altered and disguised by iron, which has been introduced into them by exhalations from the plutonic rocks on which they rest. (See Journal of the Asiatic Society of Bengal for 1847 p. 520, 21; 670, 71, 79 to 81, Journal of the Indian Arch. for February 1848, and the Notices of the Geology of the East Coast of Johore in the present number.)

2. *Journal of the Bombay Branch Royal Asiatic Society*, No I. to No. XI. (from the Society.)

* We would particularly recommend it to our countrymen in Java and Manila. The nature of this Journal precludes us from noticing what most of our readers will probably consider its most interesting articles.

We cannot do more at present than acknowledge the receipt of this most valuable work. We should be glad to publish the contents for the information of those of our readers who are not acquainted with it, and for the benefit of any of our contributors who may desire to refer to it, but this would occupy more room than we can afford.

We are obliged to postpone a letter from "*Kálámántán*," and some other miscellaneous contributions.

THE
JOURNAL
OF THE
THE INDIAN ARCHIPELAGO
AND
EASTERN ASIA.

SOME ACCOUNT OF THE NUTMEG AND ITS CULTIVATION.

By Thomas Oxley, Esq., A. B.

Senior Surgeon of the Settlement of Prince of Wales' Island, Singapore and Malacca,

The Myristica Moschata, or true Nutmeg, is known to botanists as a tree belonging to the Natural Family Myristicacæ, Class Diæcia, Order Monodelphia of the Linnæan System. It would be superfluous to enter into a minute description of a plant already so well described, particularly by Roxburgh: I shall therefore merely notice some peculiarities that deserve attention. The tree, like many of its class, has a strong tendency to become Monæcias, and Planters in general are rather well pleased at this habit, thinking they secure a double advantage by having the male and female flowers on the same plant. This however is delusive, and being against the order of nature, the produce of such trees is invariably inferior, shewing itself in the production of double nuts and other deformities. It is best, therefore, to have only female trees with a due proportion of males. But few have the moral resolution to cut down the Monæcias tree, on the principle that something is better than nothing, but they forget that the Monæcias plants having much fewer flowers, it will take three or four of them to yield the same amount of pollen as the true male, and as for the produce yielded by such trees, that of one good female is worth a dozen of the other.

The female flowers, which are merely composed of a trifid calyx and no corolla, when produced by a tree in full vigor, are perfectly

urceolate, slightly tinged with green at the base, and well filled by the ovary, whereas the female flowers of weakly trees are entirely yellow, imperfectly urceolate, and approach more to the staminiferous flowers of the male.

The shape of the fruit varies considerably, being spherical, oblong and egg shaped, but "cæteris paribus" the nearer they approach sphericity of figure, the more highly are they prized.

There is also a great variety in the foliage of different trees, from eliptic, oblong and ovate, to almost purely lanceolate shaped leaves. This difference seems to indicate in some measure the character of the produce, trees with large oblong leaves appearing to have the largest and most spherical fruit, and therewith small lanceolate leaves being in general more prolific bearers, but of inferior quality.

The object of this paper being practical, I shall confine myself as much as possible to a record of an experience extended over a period of some 20 years; and as the subject of spice planting has now become one of deep interest to very many of the Strait's settlers, I entertain a hope of being able to offer some useful hints to those already engaged in such operations, and a tolerably safe guide for future speculators. But I am by no means disposed to think that I can so exhaust the subject as leave nothing for future writers, being fully persuaded in my own mind that the cultivation of the nutmeg can still be greatly improved, and that in fact very little science has as yet been expended upon it.

The Nutmeg Planter, to use Colonel Low's expressive words, "must have the bump of perseverance myristicatically developed, and be impervious to compunctious feelings or opening his purse"; the combination also of an enthusiastic temperament with untiring patience is desirable. If he be in haste to get rich, let him attend to some other pursuit; but he has this consolation, that nutmeg planting properly conducted, although slow, is sure, and when brought to a certain point, safe and enduring; and he has the further consolation of knowing that nature has bestowed upon him a monopoly, for the nutmeg tree appears to be confined within comparatively narrow limits. Whilst its congener, the clove, has been spread over Asia, Africa, and the West Indies, the nutmeg refuses to flourish out of the Malayan Archipelago except as an exotic, all attempts hitherto made to introduce it largely into other tropical countries having decidedly failed.

The Island of Ternate, which is in about the same latitude as Sin-

gapore, is said to have been the spot where it was truly indigenous, but no doubt the tree is to be found on most of the Moluccas. At present the place of its origin is unproductive of the spice, having been robbed of its rich heritage by the policy of the Dutch, who at an early period removed the plantations to the Banda Isles, for better surveillance, where they still remain and flourish. But although care was formerly taken to extirpate the tree on the Moluccas, the mace feeding Pigeons have frustrated the machinations of man, and spread it widely through the Archipelago of islands extending from the Moluccas to New Guinea. Its circle of growth extends westward as far as Penang, where, although an exotic, it has been cultivated as a mercantile speculation for many years with success, so much so that doubtless the Penang Planters think themselves more in a situation to give than receive advice. I shall therefore beg any of those magnates who may chance to cast an eye on this paper, to bear in mind that what they read is more peculiarly applicable to Singapore than any other locality, and that moreover the plans laid down have succeeded here. Westward of Penang, there are no plantations, looking at the subject in a mercantile point of view. The tree is to be found, indeed, in Ceylon and the West Coast of India, but to grow it as a speculation out of its indigenous limits, is as likely to prove successful as the cultivation of apples and pears in Bengal.

In the Banda Isles, where the tree may be considered as indigenous, no farther attention is paid to its cultivation than setting out the plants in parks under the shade of large forest trees with horizontal branches, called " Canari" by the natives. Here it attains a height of fifty feet and upwards, whereas from 20 to 30 feet may be taken as a fair average of Straits trees; but notwithstanding our pigmy proportions, it does not appear from all I could ever learn, that we are relatively behind the Banda trees either in quantity or quality of produce, and I am strongly impressed with the idea that the Island of Singapore can compete with the Banda group on perfectly even terms. Our climate is quite unexceptionable for the growth of the nutmeg, being neither exposed to droughts or high winds; and although we may lose by comparison of soils, we again gain by greater facilities of sending our produce to market, by the ability of obtaining abundant supplies of manure, and any amount of free and cheap labour.

I shall now endeavour to lead the Planter step by step on his weary way, but just to cheer him a little, he may have the assurance

that a nutmeg plantation well laid out and brought up to perfection, is one of the most pleasing and agreeable properties that can be possessed. Yielding returns more or less daily throughout the year, there is unceasing interest, besides the usual stimulus to all Agriculturists of a crop time, when his produce increases to double and quadruple the ordinary routine.

Trees having arrived at 15 years growth, there is no incertitude or fear of total failure of crop, only in relative amount of produce, and this, as will be seen, is greatly in the Planter's own power to command. It is against reason to suppose that a tree always in flower and fruit will not expend itself if left to unaided nature; it must be supplied with suitable stimuli to make good the waste; therefore he who wants nuts must not be sparing of manure, but of this more directly.

The first requisite for the Planter is choice of location. It is true that the nutmeg tree, aided by manure, will grow in almost any soil where water does not lodge, but it makes a vast difference in the degree of success, whether the soil be originally good, or poor and improved by art. The tree thrives not in white or sandy soils, but loveth the deep red and friable soils formed by the decomposition of granite rocks and tinged with iron, and the deeper this tinge the better. I am therefore inclined to think that iron in the soil is almost necessary for the full developement of the plant. If under the beforementioned soil there be a rubble of Iron-stone at 4 or 5 feet from the surface (a very common formation in Singapore), forming a natural drainage, the Planter has obtained all that he can desire in the ground, and needs only patience and perseverence to secure success. The form of the ground ought to be undulating, to permit the running off of all superfluous water, as there is no one thing more injurious to the plant than water, lodging around its roots, although in order to thrive well it requires an atmosphere of the most humid sort and rain almost daily. Besides the form of the ground, situation is highly desirable particularly as regards exposure. A spot selected for a nutmeg plantation cannot be too well sheltered, as high winds are most destructive to the tree, independently of the loss occasioned by the blowing off of fruit and flower.

At present there is abundant choice of land in Singapore, the greater portion of the Island being as yet uncultivated, and much answering to the above description. The land can be purchased from Government at the rate of from 5 to 10 Rupees per acre in perpe-

tuity. I would advise the man who wishes to institute a plantation to select the virgin forest, and of all things let him avoid deserted Gambier plantations the soil of which is completely exhausted, the Chinese taking good care never to leave a spot until they have taken all they can out of it. A cleared spot has great attraction for the inexperienced, and it is not easy to convince a man that it is less expensive to attack the primitive forest, than to attempt to clear an old Gambier plantation overrun with the Lálang grass; but the cutting down and burning of large forest trees is far less expensive than the extirpation of the lálang, and as the Chinese leave all the stumps of the large trees in the ground, it is also more difficult to remove them in this state than when you have the powerful lever of the trunk to aid you in tearing up their roots, setting aside the paramount advantage that in the one case you possess a fresh and fertile soil, in the other an effete and barren one, for if there be any one plant more than another capable of impoverishing and wearing out land, it is the Gambier plant.

Forest land, or jungle as we call it in these parts, can be cleared for about from 25 to 30 Dollars per acre by contract, but the Planter had better be careful to have every stump and root of tree removed, ere he ventures to commence planting, or the white ants, attracted by the dead wood, will crowd into the land, and having consumed the food thus prepared for them, will not be slow in attacking the young trees. Whilst the Planter is thus clearing the ground, he may advantageously at the same time be establishing nurseries:—for these the ground ought to be well trenched and mixed with a small quantity of thoroughly decomposed manure and burned earth, making up the earth afterwards into beds of about 3 feet wide with paths between them, for the convenience of weeding and cleaning the young plants. Of course, if the planter can obtain really good plants the produce of well selected seed, it will be a great saving of time and expense to him, but unless the seed be carefully chosen, I would prefer beginning my own nurseries, and in the selection of seed would recommend the most perfectly ripe and spherical nuts. Oval long nuts are to be rejected, particularly any of a pale color at one end. Few things tend more to ultimate success than good seed, therefore too much attention cannot be bestowed upon it. I am of opinion that Planters have been hitherto very careless on this subject, hence we see such varieties of the tree, which is becoming every day what the gardeners in England call more sportive; this also partly arises from

continuing to reproduce plants from those of the place, whereas were the Planters of Penang and Singapore to interchange their seed, it would be mutually profitable. We know that the Agriculturists of Europe find it to their advantage to obtain seed for their cereal crops from places remote, and even the inhabitants of the British Isles find it necessary to make such interchanges. It is not easy to afford a reason for this, but the fact is well established, and would appear to be the fiat of infinite wisdom for some great good, perhaps to induce indolent and selfish man by the strong stimulus of self interest to a mutual reciprocity and kindness of feeling, by demonstrating to him in so practical a manner that his own good is linked inseparably with that of his neighbour.

The Planter having selected his seed, which ought to be put in the ground within 24 hours of being gathered, setting it about 2 inches deep in the beds already prepared, and at the distance of from 12 to 18 inches apart, the whole nursery ought to be well shaded both on top and sides, the earth kept moist and clear of weeds, and well smoked by burning wet grass or weeds in it once a week, to drive away a very small moth-like insect that is apt to infest young plants, laying its eggs on the leaf, when they become covered with yellow spots, and perish if not attended to speedily. Washing the leaves with a decoction of the Tuba root is the best remedy I know of, but where only a few plants are affected, if the spots be numerous, I would prefer to pluck up the plant altogether rather than run the risk of the insect becoming more numerous, to the total destruction of the nursery. The nuts germinate in from a month to six weeks and even later, and for many months after germination the seed is attached to the young plant and may be removed apparently as sound as when planted, to the astonishment of the unlearned, who are not aware of the great disproportion in size between the ovule and albumen, the former of which is alone necessary to form the plant. The plants may be kept in nursery with advantage for nearly two years. Should they grow rapidly and the interspaces become too small for them, every second plant had better be removed to a fresh nursery and set out at a distance of a couple of feet from each other. When transplanted either in this way, or for their ultimate position in the plantation, care should be taken to remove them with a good ball of earth secured by the skin of the plantain, which prevents the ball of earth falling to pieces.

The nurseries being established, the ground cleared and ready, the

next proceeding is to lay out and dig holes about 26 or 30 feet apart, and as the quincunx order has many advantages, it is the form I would recommend for adoption. The holes should be at least 6 feet in diameter and about 4 feet deep, and when refilled the surface soil is to be used and not that which is taken out of the hole. Each hole should be filled up about one foot higher than the surrounding ground, to allow for the settling of the soil and sinking of the tree, which planted even at this height will in a few years be found below the level. Over each hole thus filled up a shed, closed on two sides east and west, and proportioned to the size of the plant, is to be erected. The best substance for this purpose is I think the Attap;—lálang grass and bamboo, occasionally used, have their disadvantages, the former attracts white ants, the latter when commencing to decay, breeds a black blight that is soon transferred to the plant, injuring it most materially. It is not a bad plan to leave an open space in the centre of the top of each shed about 12 inches wide, by which the young plant can obtain the benefit of the dew and gentle rains, which more than compensates for the few rays of sun that can only fall upon it whilst that body is vertical. After the sheds have been completed, each hole should have added to it a couple of baskets of well decomposed manure, and an equal quantity of burned earth, when all is ready for the reception of the plant which, having been set out, if the weather be dry, will require watering for 10 days or a fortnight after, in fact until it takes the soil. As I have mentioned burned earth both for the use of the nursery as well as final transplanting, I may as well here explain what I mean by that substance, this earth when well prepared is quite black, friable and pungent of smell, containing potass and abundant small portions of charcoal. It is eminently useful in all kinds of cultivation, rendering friable the stiff clay and affording carbonic acid to the plants. The Chinese with good reason place much dependence upon it as a manure, and most of them know very well how to make it, but unfortunately it cannot be made in every locality as it requires a very large quantity of firewood to prepare it properly, and is only really good when made of the peaty substance that forms the top surface of all the bottoms between the hills that spread over nearly the whole island of Singapore. This manure may be useless from two causes, either if over burned when it turns red and is effete, or if not sufficiently burned, when it will be filled with chips and portions of unburned wood and become a source of attraction to the white ants, by no means desira-

ble visitants. The earth so soon as prepared ought to be placed under sheds until required for use, otherwise it loses much of its stimulating properties, particularly if exposed to heavy rains.

The Planter having set out all his trees must not deem his labours completed, they are only commencing. To arrive thus far is simple and easy, but to patiently watch and tend the trees for ten years after, requires all the enthusiasm already mentioned. About three months after planting out, the young trees will receive great benefit if a small quantity of liquid fish manure be given them. In the first six years they ought to be trenched round three times, enlarging the circle each time, the trenches being dug close to the extremities of the roots which generally correspond to the ends of the branches, and each new trench commencing where the old one terminated, they must of course greatly increase in size as the circle extends, requiring a proportionate quantity of manure, but the depth ought never to be less than two feet. The object in trenching is to loosen the soil and permit the roots to spread, otherwise the tree spindles instead of becoming broad and umbrageous. This operation might with much benefit be performed ere the roots arrive at the outer rim of the already prepared soil, instead of the usual plan of waiting until they penetrate the unloosened earth, by which many of the roots are necessarily obliged to be cut and the tree thereby checked for some months. The present plan of manuring has invariably this effect, and might be altered with decided advantage, for it can never benefit a tree to cut and destroy the extremities of the roots by which it is mainly supported. Were the trenches therefore made in an advance of the roots it would be a very great improvement in the cultivation. As the trenches are now dug for the purpose of manuring, the usual mode is to throw into the bottom of the trench all the grass that can be collected, covered by a layer of earth, filling up the remainder with manure and earth well mixed, part of which ought to be used for top dressing having previously scraped away the surface soil so as just to expose the extremities of the roots. In time the circles extending, will at last meet, and the whole of the ground having been by that time gone over, the trees ought to completely cover the ground and top dressing will then suffice. This latter would at all times be the most economical mode of manuring, and might be given after every heavy crop, but as I before mentioned it is essentially necessary to loosen the whole of the ground, or the thick fibrous root of the nutmeg cannot pierce through, and the plant will

be stunted. Some persons apply their manure fresh from the stable or cow yard. There is no question that fresh manure enriches ground more than that which has undergone perfect decomposition, but unfortunately fresh manure when brought into contact with the roots of the tree destroys them, the ends blacken and decay, and in this state, if there be white ants in the ground, they very soon attack and kill it altogether. Manure is beyond all other considerations the most important to the welfare of an estate; it is that which gives quantity and quality of produce, and without it a plantation cannot be carried on. The want of it must limit the cultivation in the Straits, and will yet bring up many a planter, who having got his plantation to look well up to the eighth year with very little manure, thinks he can go on in the same manner. But trees grows readily up to the 7th or 8th year;—it is then that really good cultivation begins to tell, and, even with the best care, trees receive a check upon their first shewing fruit, but the skilful Planter about this period will redouble all his energies, knowing that he is near to his reward, and will loose it entirely if he omits to do so. The nutmeg tree likes well all sorts of manures, but that which is best for it seems to be the well rotted stable and cow yard manure mixed with vegetable matter, and when the tree is in bearing the outer covering of the nut itself is about one of the very best things to be thrown into the dung pit. Dead animals buried not too near the roots are very acceptable to the trees, also blood, fish and the oil cake imported from Java, but the greatly lauded manure of the present day, Guano, I decidedly object to. Having tried several tons of it. I am of opinion that it is the least beneficial substance that can be given to the nutmeg tree. It certainly causes the tree to assume a deeper tint of foliage and at first to throw out young shoots, but there seems to come a very unpleasant reaction afterwards, and I am inclined to think the quality of the produce is deteriorated; at least such is my conviction on the subject that I shall never try it as manure again. With respect to the best mode of preparing and keeping manure I am disposed to the plan of placing it in pits, although in Europe stacking it in heaps is I believe generally preferred, but our climate here is so desicating that manure thus exposed will lose too much of its moisture to ferment properly, and the loss will also be much greater. Besides if it be not required for immediate use, it keeps much better in a pit covered over by a coating of earth to prevent evaporation. When required for use it ought neither to be too dry nor wet, the best state

is that of an homogeneous black paste. Equal parts of this substance and burned earth, such as already described, is the stuff to produce nutmegs, and he that uses most will get most. Slovenly cultivation is the most expensive in the end, and by far the least satisfactory.

But although manuring is the chiefest element in successful cultivation, there are many other matters for the Planter to attend to during the period that his trees are growing. All bad grasses must be carefully kept out of the plantation, at least from between the trees, and the harmless grasses rather encouraged, as they keep the surface cool. I have seen the reflected rays of the sun from an uncovered whitish soil, regularly scorch up the leaves although the plant was covered over on two sides and the top by the usual artificial shade. The trunk of the tree ought to be carefully washed with soap and water once a year to keep it clear of moss, this has been ridiculed as being a work of supererogation ;—let those who think so, omit the operation. Parasitical plants of the genus Loranthus are very apt to attach themselves to the branches, and if not removed do great injury, in fact if altogether unattended to, they will in time destroy the tree. The enemies of the Nutmeg tree are fortunately not numerous, but they have a few ; white ants among the number. I know of no remedy for these but cleanly and good cultivation, they seldom if ever attack a vigorous plant ; it is upon the first symptoms of decay that they commence their depredations,—their nests may surround a tree and their small tunnels pierce the earth in every direction about its roots without the plant giving any indications of decay, but whenever I have discovered them in such localities I have always endeavoured and often successfully, to dislodge them by a dose of a solution of pig dung, an article apparently not at all to their taste, although fresh cow dung is a strong source of attraction, another reason to those I have already given for using this latter substance in a perfectly decomposed state when it can be well mixed up with the soil, and appears no longer to have an attraction for those destructive insects, which cannot be too jealously watched, for when once they attack a tree the case is hopeless. The first notice a planter has is the withering of the leaves, and when he comes to examine he generally finds it necessary to dig up and uproot the plant at once, rather than leave it as a nidus for those voracious depredators ; every planter must lay his account to losing occasional trees by them, but he who has his ground clearest and most free of old roots and stumps of trees will lose fewest. There are several species of insects which

lay their eggs on the leaves but they are not all of equal importance; that which manifests itself by the discolorization of the leaf, and the larvæ of which are embedded in the substance and not on the surface, appears the worst, but all ought to be carefully watched and removed or they rapidly spread and cause great havoc amongst the trees. For this purpose it is necessary to wash the leaves with a decoction of Tuba root, and syringe them by means of a bamboo with Chunam and water of the consistence of white wash, this adheres to the leaves and will remain even after several heavy showers giving for the time rather an unsightly appearance to the tree, but making amends by clearing it of the larvæ already alluded to; another nuisance is the nest of the large red ant; these collect and glue the leaves together forming a cavity for the deposition of their larvæ. All leaves thus made use of turn yellow and die; they do not that I have observed otherwise injure the tree, but trees so infested do not bear well and the ants bite the collecters severely, and indeed any person incautious enough to brush against the tree. The best mode of destroying them is to hang a portion of some animal substance such as the entrails of a fowl or the like to the end of a pole, the opposite extremity of which is allowed to pass through the branches, the ants will run along the pole and collect in immense quantities around the bait, when by a lighted faggot they can be burned by thousands. This operation repeated a couple of times a day for a week or so, will rid the tree of the invaders, their nests should be broken up by the collectors as they go their rounds, but this they are very unwilling to do seeing that there are few insects more ready to revenge themselves, and the coolies never fail of a good biting whenever they try the experiment of disturbing them. I have now made the planter tolerably well aware of what he has to do and of most of the difficulties he has to encounter. I shall now endeavour to give some notion of the prices of labour and material, and speak of the work best done by contract and that which one had better perform with the labourers on the estate.

The first operations of clearing ground and digging the holes can be done more cheaply by contract labor than by men on monthly hire, very little supervision in such case being required as it is easy to see whether the ground be well cleared or not, and the size of holes being determined previously, there can be nod ispute about the matter afterwards. It is surprising how much better the Chinese work when they are paid by the task rather than the day, and singu-

lar enough they are better content, working harder and earning less by the former system than the latter. Few labourers in the world can equal them when working on their own accouut, but on regular wages they are most complete eye servants: they are however upon the whole the best class of field labourers. The usual monthly pay to good strong men is 3 to 3½ Spanish dollars per month, but those who have become expert at any particular work very soon discover their value and cannot be kept without an increase of wages. Malays are to be had for dollars 2½ per month, and it is well to mix them with the Chinese; in making sheds for trees and all work where the rattan is used, they are more expert, they are also more to be trusted, and are a very wholesome check upon the vagabond sons of Han. Patience and temper are eminently necessary to get on with the Malay; they are not to be driven, but kindness and a little banter occasionally have excellent effect upon them. The Boyans are the most quiet, the most honest, and the most to be trusted of any of the races we see here; they are very slow and not over bright, but they perform their work as well in the absence of the overseer as before him, and they are by far the best nut gatherers. The Klings, or natives from the coast of Coromandel, are good workers if they choose to exert themselves, but they are the most wretched eye servants, and seem to delight in chicanery of all sorts: unlike the Malay, fear is the only motive capable of exciting them to action, and the application of the Mundoor's or Superintendent's rattan seems the only argument they understand; they are chiefly valuable in taking care of horses or cattle, cutting grass and driving carts, all other work is better done by Chinese or Malays; their wages is about the same as Chinese labourers, that is from 3 to 3½ dollars per month.

Manuring, making sheds over young plants, and extirpating bad grasses, are works which had better be performed by the regular monthly labourers on the estate, and indeed so soon as a plantation comes into bearing all contract labour must cease, as by admitting strangers the facilities for robbery would be more than any supervision could fustrate. The number of men to be kept on an estate, to preserve it in first rate order, after it has come into bearing, must depend of course upon the size of the plantation, but in general one man for every 100 trees will be found sufficient, provided there be some 4 to 5 thousand trees. On a small scale the proportion must be greater, as the idlers, such as those who take care of and prepare the spice, gather the nuts, and manage the horses and carts, tell more

upon a small than a large scale. A man by planting the Guinea grass and feeding cattle may make his own manure and I believe it to be the best mode of proceeding ; those who depend upon the town for their supplies will frequently meet with disappoinment and never obtain such good manure. The price of manure generally speaking is about 8 cart loads for the dollar, each cart containing 20 baskets. I conceive that two such carts with a similar amount of burned earth to be little enough manure for a tree of 12 years of age. It is almost impossible for a Planter to manure the whole of his trees in the same season, if they amount to several thousands: in this case the best plan is to divide the property into sections, manuring them in regular rotation, and to apply a few baskets of manure as top dressing to any particular trees that shew symptoms of flagging.

The nutmeg Planter is under the necessity of keeping up nurseries throughout the whole of his operations, for the replacement of bad plants and redundant males. Of the latter, ten per cent seems to be about the best proportion to keep, but I would have completely Diæcious trees. No person can boast to get a plantation completly filled up and in perfect order much sooner than 15 years. Of the first batch planted, not more than one half will turn out perfect females, for I do not take into account Monæcious trees which I have already condemned. The tree shows flower about the 7th year, but the longer it is before doing so, the better and stronger will it be. I cannot refrain from a smile when a sanguine planter informs me with exultation that he has obtained a nut from a tree only 3 or 4 years planted out,—so much the worse for his chance of success, too great precocity being incompatible with strength and longevity. The best trees do not shew flower before the 9th year, and one such is worth a score of the others. This will be evident when it is stated that I have seen several trees yield more than ten thousand nuts each in one year, whereas I do not believe that there is a plantation in the Straits that averages 1000 from every tree. This very great disparity of bearing shews plainly that the cultivation of the plant is not yet thoroughly understood, or greater uniformity would prevail, and I think it clearly enough points out that a higher degree of cultivation would meet its reward. It is not quite safe to cut down the male plants upon first shewing flower, as they many times show perfectly female flowers the following year, and in that case are generally the strongest and finest trees. But there is some indication of this in the first mode of flowering. When the racemes are

many times divided and have numerous flowers, there is no chance of its becoming entirely female, but where there are only two or three flowers on a raceme there is a fair prospect of its doing so. The tree has not been introduced into the Straits sufficiently long to determine its longevity, but those introduced and planted in the beginning of the present century as yet shew no symptoms of decay. The experiment of grafting the trees, which at first view presents so many advantages, both in securing the finest quality of nut and the certainty of the sex, has still to be tried in this cultivation. Some three years ago, I succeeded in grafting several plants by approach, these are not sufficiently old for me to decide whether it be desirable or not, for although the plants are looking well and growing, they as yet have thrown out their branches in a straggling irregular manner, having no leaders, and consequently they cannot throw their branches in the regular verticles necessary for the perfect formation of the tree, without which they must ever be small and stunted, and consequently incapable of yielding any quantity of produce. The grafts have succeeded so far as stock and scion becoming one, and in time a perpendicular shoot from the wood may appear. If after this it should increase in size and strength so as to form a tree of full dimensions the advantage gained would be worth any trouble, the quality of some nuts being so far above that of others it would make a difference beyond present calculation; in short 1000 such picked trees at the present prices would yield something equivalent to twenty thousand dollars per annum, for $\mathcal{S}$ 20 per tree would be a low estimate for such plants. If this ever does occur it will change the aspect of the cultivation altogether, and I see no good reason why it should not, except that those possessing trees of the quality alluded to, would not very willingly permit others to graft from them, so it is only the already successful planter who can try the experiment properly.

In addition to keeping the trees clean and free from moss and parisitical plants, it is highly desirable to use freely the pruning knife, cutting away all perpendicular shoots, the decayed ends of branches, or whenever the verticles are too close thinning them too admit air and sun to the centre. From over bearing, poverty of soil, or lodgement of water, it frequently happens that the top of the tree withers and the whole of the plant will soon follow, unless it be cut down below the affected part; if this be done in time it generally saves the tree which after a few months will throw a shoot from the hard

wood of the stem to replace the former loss. Young plants are all the better for having the two or three first series of verticles cut off, otherwise the tree becomes too shrubby and the lower branches touch the ground excluding air, forming altogether a very inferior plant. This practice would however be unsafe in places like Penang affected by droughts, unless the plants be kept well shaded, until the upper verticles are sufficiently large to afford protection to the roots. As the tree bleeds freely upon being cut, the Pruner ought to take along with him a pot of cement formed by boiling together two parts of pounded chalk and one of vegetable tar, which applied warm stops the run of the sap, gradually hardens and will remain on the cut part until it be quite healed. I have seen it stick on for several years resisting all weathers.

Some trees from receiving too great a check are apt to overbear, and will soon wear themselves out if not watched and relieved of their superabundant fruit. This ought to be done so soon as the fruit forms and if permitted to remain until three fourths grown the mischief is already effected and cannot easily be remedied, but even should the tree not perish, the crop will scarcely be worth the gathering so inferior will be the quality and the tree unable to perfect its fruit, which splits ere the mace is red and while the nut is soft and good for nothing. Unhappily some trees have a habit of splitting their fruit untimely although their general appearance indicates strength and vigor. This is a fault for which as yet I know of no remedy; I attribute it to an original fault in the seed, and if this be correct I fear it admits of none.

The planter having his tree arrived at the agreeable point of producing, has but slight trouble in preparing his produce for market. As the fruit is brought in by the gatherers, the mace is carefully removed, pressed together and flattened on a board, exposed to the sun for three or four days, it is then dry enough to be put by in the spice house until required for exportation, when it is to be screwed into boxes and becomes the mace of commerce. The nutmeg itself requires more care in its curing, it being necessary to have it well and carefully dried ere the outer black shell be broken. For this purpose the usual practice is to subject it for a couple of months to the smoke of slow fires kept up underneath, whilst the nuts are spread on a grating about eight feet above. I myself prefer one raised fully 10 feet, but the model of a perfect drying house is easily obtained, and the process is too well known to require any further explana-

tion. The only caution I would give is that planters ought to take care and not dry their nuts by too great a heat as they shrivel and lose their full and marketable appearance; for this purpose I think it desirable to keep the nuts, when first collected, for eight or ten days out of the drying house, exposing them at first to an hour or so of morning sun, and increasing the exposure daily until they shake in the shell; the nuts ought never to be cracked until required for exportation or they will be attacked and destroyed by a small weavel like insect, the larvæ of which is deposited in the ovule and, becoming the perfect insect, eats its way out, leaving the nut bored through and through and worthless as a marketable commodity. Liming the nuts prevents this to a certain extent, but limed nuts are not those best liked in the English market, whereas they are preferred in that state in the United States. When the nuts are to be limed it is simply necessary to have them well rubbed over between the hands with powdered lime. I am given to understand that they are steeped in a mixture of lime and water for several weeks by the Dutch mode of preparation. This no doubt will preserve them, but doubtless it must also have a prejudicial effect on the flavor of the spice. After the nuts are thoroughly dried, which requires from six weeks to two months smoking, they cannot be too soon sent to market. But it is otherwise with the mace, that commodity when fresh not being in esteem in the London market, seeing that they desire it of a golden color which it only assumes after a few months, whereas at first when fresh it is blood red; now red blades are looked upon with suspicion, and are highly injurious to the sale of the article. This is one of those peculiar prejudices of John Bull which somewhat impugns his wisdom, but it must be attended to, as John is ever ready to pay for his caprice; therefore those who provide for him have no right to complain although they may smile.

Through the kindness of the Resident Councillor I have been furnished with the following correspondence and statistics which shew that the nutmeg tree was sent from Bencoolen to Singapore the latter end of 1819, so that twenty nine years have elapsed since its first introduction. Some of the plants alluded to in Sir Stamford Raffles' letter were set out at the foot of Government Hill in neither a bad soil nor locality, and several of them are at present and have been for the last ten years fine fruitful trees. Table No. 1 shews that 315 trees in this garden yielded last year 190,426 nuts or at the average of 604 for each tree, but of the 315 bearing trees mentioned in the

table not over fifty are of the old stock, most having been planted since 1836, so that a Planter may safely calculate on having a better average than is here set forth, provided he attends to his cultivation and his trees are brought up to the age of 15 years. If a plantation be attended to from the commencement, after the manner I have endeavoured to explain, and the trees be in a good locality, the Planter will undoutedly obtain an average of 10 lbs. of spice from each tree from the 15th year. This at an average price of 2s. 6d. per lb. is 25 shillings per annum. He can have about 70 such trees in an acre, so that there is scarcely any better or more remunerative cultivation when once established, but the race is a long one, the chances of life, a high rate of interest in this country make it one of no ordinary risk, and it is one that holds out no prospect of any return in less than 10 years. A person commencing and stopping short of the bearing point either by death or want of funds will suffer almost total loss, for the value of such a property brought into a market where there are no buyers must be merely nominal. Again if the property has arrived at the paying point, almost any person of common honesty can take charge of and carry it on, for the trees after 12 years are remarkably hardy and bear a deal of ill treatment and neglect; not that I would recommend any person to try the experiment, but it is some consolation for the Proprietor to know that stupidity will not ruin him, and that even at the distance of thousands of miles he can give such directions as, if attended to, will keep his estate in a flourishing and fruitful state.

I have now set the pros and cons of nutmeg cultivation before the reader. Should he like to try the experiment there is ample scope and verge enough for him in Singapore. He need not be afraid of failure if he proceeds with energy and perseverance. The cultivation, as will be seen by the appended tables, is rapidly extending, and I fear the prices are falling. Should the Moluccas be thrown open I cannot answer for how much greater may be the depreciation in value, but a produce that requires 15 years to bring it to market in remunerative abundance is not so easily overdone. The tree is not more quickly productive in the Island of Banda than in the Straits, and, as I have before said, neither do they excel us in relative quantity or quality. Those who have established plantations may laugh at the bugbear of over production and rest content even with some further reduction in prices.

The consumption is increasing and likely to increase in the Uni-

ted States, and no doubt were the heavy duty exacted in England lightened, the consumption would also increase in Great Britain. At present the duty is above the value of the article, which is any thing but encouragement to our eastern colonies, and is hardly fair considering that the differential duties have been done away with and that we have to compete on equal terms with our monopolizing neighbours the Dutch, who take very good care to make no reciprocation in favor of British commerce.

To Major FARQUHAR,

Resident and Commandant, Singapore.

Sir,—Enclosed, I transmit a list of Nutmeg and Clove Plants this day shipped on the "Indiana" for Singapore, and put under the immediate charge of Mr Dunn, who is proceeding thither on the same ship.

100 Nutmeg Plants, in 3 boxes
100 Clove do. in 3 do.
1000 Nutmeg seeds, half of them in a double row.
350 Clove ditto.
25 Large Nutmeg plants and the same number of Cloves.

You will be pleased to report the condition in which these Plants are received, and to exert your utmost endeavours to establish the cultivation under your immediate authority.

I have &c.

(Sd.) T. S. RAFFLES.

Fort Marlbro', 18*th August*, 1819.

To the Hon'ble Sir STAMFORD RAFFLES Kt.

Lieut.-Governor, &c. &c., Fort Marlbro'.

Hon'ble Sir,—I have the honor to acknowledge the receipt of your letter dated the 18th August covering a list of Clove and Nutmeg Plants shipped on the "Indiana" under charge of Mr. Dunn, and have much pleasure in informing you that the whole have been landed safe and in good order.

The larger plants have been regularly planted out where it is intended they should remain, and the seed and smaller ones put in nursery beds for the present, the whole are in a thriving state,—you may depend on every possible attention being paid to the cultivation of Spices, and I consider myself fortunate in having Mr. Brooks, a European Gardener, here, whose services will be very

useful in superintending generally the Spice plantations, and propose to allow him a monthly salary of 40 Spanish Dollars until your pleasure is known on the subject.

I have &c.,

(Sd.) W. FARQUHAR,

Singapore, 28th Oct. 1819. *Resident.*

TABLE I.

Statement of Nutmeg Plantations with number of Trees, Trees in bearing, and produce in 1848.

Proprietors.	Districts.	Total No. of Trees.	No. of trees in Bearing	Produce in No.	Produce in weight.		Remarks.
A. Guthrie, ...	Tan. Pagar	2,250	..	252,581	19	30	The greater number of the trees in Singapore, as will be observed from this Table, have not come into full bearing, but the produce is increasing rapidly, and this year will amount to fully 500 piculs.
W. Montgomerie,	do.	1,800	1,200	368,791	..	..	
Joaq. Almeida. ..	do.	700	400	307,609	..	..	
Government, ...	Claymore.	765	315	190,240	..	..	
Dr. T. Oxley, ...	do.	4,050	2,322	902,426	66	76	
C. R. Prinsep, ..	do.	6,700	5,200	749,836	60	..	
T. Hewetson,....	do.	1,515	750	492,329	37	02½	
C. Carnie, ...	do.	3,500	500	..	9	93	
W. Cuppage, ...	do.	1,250	647	148,120	10	..	
W. Scott,..... ...	do.	5,200	1,700	348,711	23	65	
C. Carnie, ...	do.	870	250	..	3	50	
Jose Almeida,....	do.	1,023	150	36,500	..	..	
Dr. M. J. Martin,.	do.	1,530	700	288,218	21	..	
W. W. Willans,..	Tangling.	1,600	100*	..	..	..	
E. B. Leicester,..	do.	800	100*	..	..	..	
E. Leicester, ...	do.	400	..	..	..	..	
W. Leicester,...	do.	250	..	..	..	..	
W. Montgomerie,	Kalang.	510	200	..	..	20	
F. Sorabjee,.....	Rochor.	12	..	..	..	..	
Syed Allie, ...	do.	600	30	..	..	71	
Sir J. d' Almeida,	Sirangong.	4,000	350*	..	..	..	
T. Dunman, ...	do.	1,000	..	..	..	..	
J. I. Woodford, ..	B. Timah.	600	..	..	..	..	
Chinese &c., ...		7,000	..	..	..	..	
G. Nicol,..		8,000	..	..	..	..	
		55,925	14,914	4.035.361	252	07½	

Singapore, 24th July, 1848.

* Commencing to bear.

Statement of the Exports of Singapore Spices in 1845, 1846, *and* 1847.

Years.	Nutmegs.	Mace.	Cloves.
	Pls. cat.	Pls. cts.	Pls. cts.
1845	in No. 136. 64½	37. 44½	2. 55
1846	1200 and 208. 79½	60. 74	. 33¼
1847	4 boxes and 105. 55	3 boxes & 34. 33	. 03¼
Total for 3 years	1200 in No. 4 boxes and 450. 99	3 boxes & 132. 51½	2. 91½

A TRIP TO PROBOLINGGO.

By Jonathan Rigg, Esq.

Member of the Batavian Society of Arts and Sciences.

(Continued from p. 563.)

An afternoon was devoted to an excursion to Bezoekie the chief place of the residency. The road continues for about three pauls through the rich flat, which we found crowded with luxuriant cane fields, destined to yield next years's crop to the mill of Pahiton. Soon after this we reached the Post station Watas, and here two pillars mark the boundary between the divisions of Bezoekie and Probolinggo, the latter being only an Assistant Residency under the former. You now enter the district of Binor, and, rising a little, the scenery suddenly changes, when you find yourself in a barren scraggy, bush country, bearing a trifling population, but tenanted by plenty of game, particularly Hogs, Kidang, Deer, jungle fowls and the tyrant of them all, the tiger royal. This sort of country continues for six or seven pauls, and is the abutment of the chain of the Iyang mountains upon the ocean. The ground rises in hills immediately from the sea, along which the high road is laid out, winding round the little promontories, and into the sinuosities caused by the vallies coming down to the shore. The hills are rocky and barren, affording for Java a rather uncommon sight; they are mostly sprinkled with dwarf teak trees, the shoots from the stumps of timber felled long ago. In the midst of this range is a pretty broad valley with a flat of sawahs, and here is situated the village and Post station of Bányu Angat (Luke warm water). This name has its origin in a pretty considerable spring of water, which gurgles out of a bank, on the side of a small rivulet, a little way behind the Post house. To this the village chief conducted us; but neither vapour nor smell indicated the presence of volcanic heat; our guide, indeed, acknowledged that the warmth was only perceptible in the night time. The heat may very likely have diminished in later times, as the fire under the Iyang has long slumbered, having found vent by the Ringgit and Lamongan at either extremity of the range. Lonely is the way which you pursue along the seashore, the road being often overhung by rocks and rising ground, from which a few

banditti might easily overwhelm the traveller with stones; escape would be easy either to the wild mountains above, or by boat to seaward, as the tide often washes up to the road, and good shelter is found amongst the mangrove bushes. We observed that at one place an attempt had been made to burn lime from the coral growing on the coast; but its impurity had caused the undertaking to be again abandoned;—at Pahiton, all their lime has to come from Grissee.

At about four pauls from Bezoekie, the range of the Iyang is found to terminate at the sea in a bluff but conical and nearly bare mountain called Gunong Tamporá, which stands out on a small promontory and said to have very deep water, nearly 17 fathoms, close to it. The road crosses a hollow ridge, inland of the Tamporá, where coolies are required to assist the horses in dragging over a carriage. A deep cut, however, is being made into the ridge, which will do away with the difficulty, but the work goes on slowly from the nature of the ground, being shaken and shattered rock, so as to make blasting of little avail, but so hard and fast, as to make the munual labour very troublesome. From this point to Bezoekie, the hills again recede, and you roll through a flat and fertile patch of land. The approach to the provincial capital is through a broad and elegant avenue of tamarind trees, planted by the Resident Dr. Bruin Prins, 15 or 16 year ago. The trees are already well up and afford an inviting shade on either side of the road, but it will require a few years more before their full magnificence can be felt. Evening coming on, I saw little of Bezoekie, and that little was uninteresting. It is a rather out of the way place, and hardly any Europeans are found here, except the employés of Government. The Aloen Aloen is but small, and has on its south side the dalam of the Regent, and dwelling of the Resident. The north side was shut in by a piece of wall within which is the commandant's abode with the barracks of a few native soldiers. I was told of an old Arab here, who has a *Date* tree which yields him *fruit*; the only one I ever heard of in Java. The Date grows willingly enough wherever planted about the sea shore, but this is the first instance I ever heard of its bringing its fruit to perfection, and the next question would be whether its seeds would vegetate and grow to another fruit bearing tree, without which the fact would be only a solitary anomaly, similar to the rare fecundity of some few hybrids. The old Arab however, is not a little proud of his tree, and sells the fruit at a doit or a goband each, as his supply is scant or great. We returned to Pahiton by moonlight,

and in the neighbourhood of Binor saw plenty of wild pigs crossing the road.

I returned to Probollingo with the Jane Serena on the morning of the 2nd. December, and immediately despatched her on her intended voyage, proposing to return myself overland to Sourabaya. Probolinggo is a thriving little place and much improved since I saw it in 1839. Several neat brick built European houses have lately sprung up, amongst which is an hotel, though rather too small when three or four Europe Dutch ships are loading in the roads and the Captains living on shore. The house of the Assistant Resident is roomy and lately rebuilt; on a piece of ground near it, it is in contemplation to build a church. A large new pássar, with convenient open sheds covered with tiles, has lately been established on the eastern confines of the town. The great extension of the sugar cultivation in this province has given rise to this prosperity. The greater part of the town lies between the great post road and the sea. The residency however, is on the south side of this road, facing a broad street which leads off at right angles to the sea. Here are situated most of the new houses above alluded to. This street runs in a straight line to the Alun Alun, and may be nearly half a paul long, and has trees planted on either side. In the corner at the Alun Alun is the Dalam of the Regent, and opposite to it an oblong brick enclosure, by way of an excuse for a fort, where a few Javanese troops are lodged. A little away behind this, are the government warehouses and the harbour all constructed about 8 or 9 years ago for the convenience of collecting and shipping the sugar, coffee and other produce of the surrounding country. The coast here is an even flat beach without any natural port, creek or inlet. With the augmenting produce, it was therefore found necessary to construct some suitable place of shipment, and this has been done by excavating a basin round which the warehouses are built, and from which a harbour or canal leads out to the sea between two artificial piers called the "Brukan," constructed of masonry and coral rock. The tide rises and falls here about 8 feet, but the newly constructed harbour is found to suffer from silting, and what the south east monsoon piles upon the coast is not found to work away clear when the winds change and blow from the opposite direction; at low water a tambangan can hardly pass out to seaward. A little before the tide was at its lowest, I myself in a light ship's gig had much difficulty in getting out after sticking in the sand.

Boats with cargo have thus to watch the opportunity of the tides to go out and return. This Brukan is nearly half a paul long and has cost much labour and expense, and after all is not a satisfactory piece of work, as the pier heads give way to the waves; we found them busy making repairs to this part. It is necessary to protect and strengthen the work by timber driven into the ground; this the sea worm immediately attacks and in about three years the finest beams of teak crumble by its depredations. The part attacked and thus destroyed is such as the rising and falling waters work upon; wood in deep water or in the ground is never touched. No attempt is made by engineers to obviate this evil, but they are perhaps hardly to blame as the government cripples them in their expenditure, and in order to make any new experiment, more writing, more talking and more troublesome forms have to be gone through, than in going on in the old routine; some one worn out beam is pulled out and another knocked down in its place, to be in its turn as speedily destroyed. No attempt has been made to "Kyanize" the timber by soaking it in a solution of corrosive sublimate, and which in England is found to produce such beneficial effect on wood. The plan which is adopted in American ships to economise copper in the upper streaks, might perhaps be tried with advantage, viz. laying on a solution of Arsenic in the shape of a paint; this repeated occasionally might keep off the worm. Short nails with very broad heads might be studded over the surface with effect. But to any proposition of this kind, the immediately reply is "Maar wat zou dat veel kosten," (but what an expense that would be) which is quite enough to deter the authorities from bringing it to the notice of government, which adopts the maxin that that man is a good servant, who keeps matters in order without making any call on "'sLands Kas"—(the public chest) no matter how the native population are worked and harassed or what valuable timder is consumed, which can be had for cutting in the forest. At Probolinggo they are just now dropping the use of Teak, as they fancy they have discovered that the sea worm either does not at all or very rarely molest the stem of the palmyra, borassus, raphis flabelliformis. They have been brought to this conclusion by observing its durability when employed as palisades or in the construction of bridges on the main road, where the salt tide reached; ordinary timber soon perishing from the attacks of the worm, whereas this tree has been found to stand good for a considerable time. In common with all palms, the outer layer or wood

of this tree, called " Ruyung" is stringy and very hard, whilst the centre is soft and spongy; in order to be able to drive it into the ground, it is necessary to cut the lower end in the shape of a wedge, so as to bring the ruyung to a sharp edge, and so save the heart from the violence of the blows. At the top, in order to prevent the rain water from working its way into the heart and thus rotting the soft centre of the tree, about a foot of the pith is scooped out and replaced by cement; the whole is then well covered with coal tar. This palm is found in great abundance at particular spots on the coast, in the eastern districts of Java, and has perhaps originally been introduced from the continent of India. In Sumatra and the western or Sunda districts of Java, it is only rarely found and that in the neighbourhood of the sea shore. Eastward of Samarang it begins to be more plentiful. At Tuban, Grissee and the opposite coast of Madura it is very abundant, as well as about Bezoekie. Large quantities of Toddy, here called " Legén" are tapped from the tree about Grissee and daily brought by boat loads for sale in the town of Sourabaya. It is not found at a distance from the sea coast, and being most abundant at the eastern end of Java, where in all probability was the great emporium, in days of old, to which the Hindus resorted in quest of the spices brought from the Moluccus, such a tree, of so much use on the continent of India, was very likely to be introduced by the traders. From time immemorial, its leaves were the material on which oriental nations wrote with an iron stile, to which their sacred writings were committed, on which their daily transactions were recorded. On the continent of India and in Ceylon, it is to this moment in universal use amongst the natives. In Java it has been supplanted in a great measure by cheap Chinese and European paper, but on the neighbouring island of Bally, it is still in great requisition. Its name, even in Java still points to its Hindu origin of *Tala* or *Tal*. In Sumatra and the Sunda districts both the tree and leaf are known by the name of *Lontar** which Crawfurd says is derived from the ancient Polynesian word *Ron*, a leaf and *Tal*, the Palmyra, only that the initial *R* and *L* have been transmuted. To the eastward a greater variety is found in its designations. From Samarang to Tuban, the word

* There are no Lontar groves in Lombok and the tree is only found growing where it has been planted as a curiosity. In this Lombok differs from Bali, where every where forests of it are found and it is known by the name of *Dontal*. The lontar sugar on Lombok is imported from Bali. —Zollinger. Tjdschrift 9th year No. 5. page 201. 1817.

Lontar is applied exclusively to the *leaf* on which is written, and the tree itself is known by the name of *Siwalan*. Further eastward these words are not in use. From Grissee to Bezoekie the leaf is called *Karopak*, and the tree, *Ental*, the final syllable of which is again Hindu. Its durability in sea water is shown by the preference given to it by the natives in the Straits of Madura, for fishing stakes.

Probolinggo is not the name by which the natives in general designate the place, as they most usually term it Bangér, a name said to mean "stinking" and applied to a small runnel of water in the neighbourhood. So also the town of Pasuruan is known to few natives by that name, as they in general call the place, Gembong.

From Probolinggo to Sourabaya, a Diligence or Post-Wagen runs twice a week, the fare to Pasuruan being *f.* 12 and from that further *f.* 16 copper, the total distance being 66½ pauls. Over this space of ground, the right to keep post horses is farmed out by government and has hitherto been let for *f.* 525 per month. I availed of this conveyance for my return, and we performed the distance of 24 pauls to Pasuruan in about 3 hours. On leaving Probolinggo, you enter the district of Grati, and find yourself in a slightly hilly and undulating country, which forms a kind of embankment between the rich flats of the former place and Pasuruan. On looking to the Tengger mountains a few miles inland, you see the deep gap and gorge with which its face is furrowed, first running out northward from the Bromo; but latterly turned at right angles towards the west, till it terminates at Sukapura, about 3,000 feet above the sea. At this point, it is evident, that an immense mass of earth and matter has been poured out upon the plain below, and the high broken land of Grati is the result of the catastrophe, which has desolated and destroyed the upper regions of a former state of the volcano Bromo. This gorge, called the *Jurung Penganten*, is about 10 pauls long and terminates above, at the Chamara Lawang, on the edge of the Dassar. M. Zollinger, the naturalist, in a late publication (Tijdschrift, 8th year No. 2 p. 146) declares the Bromo to be a crater of elevation, pushed up at some former time into its present shape and height, and that it never possessed a cone to be destroyed. He is in this article combating the opinion of M. Herwerden, who espouses a contrary opinion in the 20th vol. of the Batavian Transactions. M. Z. appears to wish to deny or not to comprehend the possibility of a volcano succumbing within its own vortex, leaving a vast surrounding wall composed of volcanic strata dipping outwards

in all directions from a common centre, from which they originally accumulated, *during ages*, the materials of which they consist. No, M. Z. would have us believe that the great mass of the Tengger mountains, spring up *once (eens)* like a mushroom, and that the great accumulation of volcanic debris in and upon the Tengger, has been thrown out of the comparatively puny foci now found in the Dassar. Were such the case how comes the Dassar to exist at all? The nearer a volcanic aperture, the greater the accumulation of matter, witness all volcanic cones and especially the neighbouring Semeru. How came the Bromo, Batok, Widadaren or Segara Wedi, to throw out their materials round a radius of a few miles before these were able to drop? How can they, situated in a vast gulf, have been in a state of great activity, and not have, in the first place, clogged up that gulf around themselves? Granted for a moment that they had that wonderful power, how came it that the great gap of Chamara Lawang was not filled up like the rest of the circle wall, but left 200 or 300 feet lower, with well defined and abrupt sides? and yet almost the same height above the floor of the Dassar. Odd it would be, that from this very gap leads downwards the gorge of Jurung Penganten, which has so clearly poured out so much matter on the lowlands. Odd that this same Jurung Penganten, if a radiating crack of an elevation crater, should not have cracked down to the level of the plain, but instead of narrowing downwards have terminated in a broad portal at 3000 feet above it. And yet no other main cracks are visible on this side of the mountains to satisfy the theory of Von Buch, by which such tremendous masses are imagined to be disrupted and suddenly thrust upwards. The numerous other ravines which furrow the face of the Tengger are water worn and the result of time.

Is it the love of, or loyal attachment to a fanciful theory, that has induced M. Z. to say—"Thus all the volcanic debris in and upon the Tengger mountains, and around the same are not produced from a former, imaginary large crater, which has fallen in, but most assuredly from the eruption-craters in the great vortex"? Under his latter supposition he grant the cause, the power and the effect which a contrary opinion requires, whilst he calls upon us to explain the modus operandi in an unnatural, nay, even impossible manner. I have spoken of the later foci in the Dassar as being comparatively puny, by which I mean that they have never been able to throw out any considerable mass of matter, beyond the wall which en-

circles them, and which is also higher than they are; light ashes and dust have however been frequently drifted away by the prevailing winds. The Bromo and its coadjutors stand in the same relation to the Dassar, as Vesuvius to Monte Somma, only the former have never been able to fill up and encumber their situs, to the extent which Vesuvius has done its own, and the reason of this is, in all probability, to be found in the fires having found vent through other apertures, more especially the Semeru and Lamongan. The Lamongan and Bromo have indubitably some internal connection. In 1824, the Resident Langewagen wrote "as soon as you saw heavy smoke ascend from the Bromo, the Lamongan ceased to burn."—(Java Courant, 20th. October, 1827.) In 1829, the Bromo was in a state of activity, but quietly died away till in 1835 its crater was all at once found to be occupied by a pool of water. The Lamongan now came into a state of activity and remained so till the beginning of 1841, when its crater top suddenly tumbled in, and stopped the vent so effectually that for many weeks, not the least smoke was seen to rise from it. Things remained in this state of quiescence for some time, but on the 24th September a pretty smart earthquake, a phenomenon here rather unusual, reminded the inhabitants of Lamajang that the internal fires were still at work. This slumber was broken on the 25th January 1842, by the Bromo again coming into activity. The pool of water was gone, and an eruption of stones and ashes took place, attended by internal grumblings which were heard to a distance of 40 or 50 pauls. The eruption continued with violence for upwards of two months, and at night presented a glowing burning column playing from the top of the crater. Three or four eruptions took place in a minute, so that the stones falling backwards were again blown out. "The greater part however" says M. Herwerden, who was an eye witness, "tumbled back into the crater, only a few rolled down the outside of the hill, when they remained visible, for some minutes as glowing points." So much for the strength of an eruption, after 12 years' quiescence of the Bromo itself, and after its safety valve the Lamongan had ceased to act for nearly a year. Since 1842, the Bromo has been pretty quiet, a dense, grey cloud of smoke constantly rising from the bottom of the crater. The Lamongan again smokes, but only faintly, as I saw when at Pahiton; the Semeru at intervals sends forth its accustomed quota of clouds and ashes. As long as these two vents continue to operate, the Bromo will be unable to accumulate energy sufficient to fill

up the gulf of the Dassar which is the counterpart of Atrio del Cavallo, under the rim of Monte Somma; should they however, ever be stopped up effectually for any considerable length of time, then we may expect that it will cause the same effects as were realized in Vesuvius, when Ischia, Solfatara, Monte Barbara and Monte Nuova had long slumbered in quietness. The intervening periods of rest in these cases were for Vesuvius, from the remotest period of which we have any traditions till A. D. 79, during which time however, Ischia was much convulsed. Vesuvius was active in 203, and for the third time in 472 and again in 512, 685 and 993, then in 1036, when lava first appeared and 1049, and again in 1138, to which succeeded a repose of 168 years till 1306. Between this eruption and 1631, there was only one other (in 1500) and that a slight one. It has been remarked, that throughout this period, Etna was in a state of unusual activity, and in 1538, the new volcano of Monte Nuova came into existence. Since 1666 there has been a constant series of eruptions from Vesuvius, with rarely an interval of rest exceeding ten years, but the rest of its district and neighbourhood has enjoyed tranquility.—(Lyell vol. 2. p. 78.) On the western confines of the volcanic debris, described as having issued from Sukapura, is found a small lake, known to the Dutch as the " Meer van Gratie," and to the natives as " Ranu Kalindungan", the hidden lake. It is seen at about a good mile to the south of the main road, a little to the west of the Post station " Asem Lawang," buried within steep and high banks, which, in a state of nature, being covered with forest may have so far sequestered the lake as to lead the natives to call it the " Hidden." The people have a tradition that a village of the name of Kalindungan was once engulfed here, and the spot transformed into a lake. This is accounted for by a superstitious legend, but is a circumstance not unlikely to occur in a volcanic country, by a partial sinking in at the time of convulsion by earthquake. The lake covers a surface of 130,290 square Rhineland roods, and receives a brownish tinge from some wells. It is only a trifle higher than the level of the sea. The village of Dawi, on its banks, is celebrated for its immense flocks of ducks, the eggs of which are salted and form an important article of native trade and consumption. A worm, called *Cheret*, found in the ground here and which is greedily picked up by the ducks, is said to give to the yolk of the egg, its fine, red color and peculiar richness.—Java Courant 27th November 1828.

At Pasuruan, I found the new Resident Varkeorseer, making great improvements about the town, pulling down old dilapidated fences and replacing them with neat brick walls. Also the whole of the Residency they are building up earthen dykes or walls on each length side the roads and laying out a cart way parallel to that for carriages, in the same way as adopted in the districts to the westward.

After attending the ceremony of elevating the Regent from the rank of Tamongong to that of Adhipati, and witnessing the native tournament or "Seninan" given on the occasion, I returned to Sourabaya during the night from 6th to 7th December.

Sourabaya, 31st December, 1846.

Note to page 538.

New Channels have lately been discovered to be naturally forming themselves at either end of the Straits of Madura. For this discovery navigation is indebted to the unwearied exertions of Lieut. Jansens of the Dutch Navy who during the course of 1846, made accurate surveys of these approaches. The passage out to the northward, instead of turning N.W. round fort Erfprins, goes out in one straight line right across the middle of the sea bank in a course a little to the eastward of north. The first vessel taken through this channel was the Brig Rembang Captain Deighton in July 1847, under the guidance of Lieut. Jansens himself, since when several other ships have also used it and amongst others the private Steamer Koningin der Nederlanden and the Government Steam Packet ship, "Batavia." The least water in the shoalest part, at spring tides is about 9 feet but deepens to about 15, at high tide. It is found to be deepening at about the rate of 9 inches in the 12 months, and Lieut. Jansens is sanguine that, with the use of the dredging machine, during only one south east monsoon, he would clear out a passage for ships drawing 18 feet. Government officials, however, do not appear to be disposed to afford him this opportunity of rendering so important a service, nor has the place yet been properly buoyed off being only pointed out by Jansen's original bamboo stakes.

The new channel from Soerabaya out to the sea, south of Madura, is said to be forming on the Java shore of the Strait, but the Water in the usual passage being still considerable, little notice is as yet taken of the new one.

Note to page 540.

When Marshal Daendels visited Sourabaya in June, and July, 1810 he found a great deficit in the finances of the east end of Java, amounting for the department Sourabaya to the sum of 235,816 Rix dollars and for that of Samarang to 645,510 Rix dollars. To disentangle himself from this difficulty, without drawing from Batavia the little silver money which was in the treasury there, he resolved to part with government lands, and a number of lots were parcelled out around the towns of Samarang and Sourabaya and sold by auction to private individuals. A transaction, however of greater importance enabled the Marshal more effectually to compete with his financial difficulties. This consisted in the sale of the lands of Bezoekie and Panarukan to the Captain Chinaman of Sourabaya Han Chanpit, who already possessed a lease farm of the same territory for as long as he lived, at a yearly rent of only 9,000 Rix dollars. The Marshal ordered Van Middlekoop the Landdrost of Java's Oosthoek and Hesselaar, Drost of Pasuruan, to value these lands and they reported that a sale at 400,000 Rix dollars would be advantageous for the government, but His Excellency succeeded in striking a bargain with Han Chanpit for 400,000 Spanish dollars, or $\frac{1}{3}$ more, thus 533,333 Rix dollars, for which the Captain Chinaman soon after settled, by taking over government debts and passing assignations to the amount of 503,959 Rix dollars and paying the balance of 24,374 Rix in specie.

This, however, was not sufficient to cover the deficit and as it was necessary to make provision for meeting not only the necessary expenses of Sourabaya and Samarang, but also to be in funds to pay for the Coffee which during the ensuing year would be delivered from the Jacatra and Cheribon Prianger Regencies, the Marshal, at the close of the same year 1810, made up his mind to sell the Regency of Probolinggo. This extensive and fertile district, at that time produced very little for government, being only 2000 Spanish dollars for recognition money, $70\frac{2}{3}$ koyans of rice, 140 Spanish dollars for the farm of 14 Birds nest caves, besides a trifling profit on the delivery of Coffee and teak timber cultivation was in a miserable state. It was the Marshal's opinion and argument that no great or permanent improvement could be secured without giving to private individuals a proprietory right to the soil, when they would be induced to lay out capital upon its improvement, and thus procure for the colony an increase of produce which could not but prove beneficial. The family of Han Chan pit were the only persons possessed of sufficient means for entering into such extensive operations as here contemplated. Han Chan pit himself immediately offered 600,000 Spanish dollars, which was more than the estimated value of the place, and more than it was likely to fetch at auction if put up in one lot or even divided into three. The Marshal being pinched for funds demanded a part payment within six months of sale and the remainder in instalments of which the last should be due on the 1st. July, 1812; the Chinaman proposed to pay off in ten years in suitable

instalments. This difference of views and wishes led to another arrange- by which Han Tilko Captain Chinaman of Pasuruan and brother of Han Chan pit, became the purchaser of the lands of Probolinggo for the sum of 1 million Rix dollars payable in ten years in six monthly instalments of 50,000 Rix dollars each, of which the first was to take place on the last of June, 1811. The second on the last of December 1811, and so on. In order to procure the immediate use of this capital for the government, a credit paper was issued of which 50,000 Rix dollars was to be redeemed with specie every six months, as Han Tilko made his payments, and the particular number to be so redeemed, were to be decided by lot. The further terms on which this sale was made were—that for the prompt fulfilment of the purchase money, the lands of Probolinggo itself should be mortgaged, as also those of Bezoekie and Panarukan belonging to his brother Han Chan pit, no transfer duty to be exacted, the teak forests to be at the disposal of the purchaser who was at same time relieved from the forced cultivation of Coffee, or any other compulsory contingent, customs duties and the Opium farm to remain the property of the government, but the roads to be kept in order by the purchaser, who was also bound to supply the means of transport of government goods and to submit to all other services which were usually exacted from private lands.

Daendels Staat der Nederlandsche oostindische bezittengen. Hague 1814—Tweede stuk, verkoop van Domeinen.

SOME NOTICES OF THE NORTHERN OR DUTCH HALF OF CELEBES.

THE *extent or area of the Dutch possessions here*, is 1100 square miles, lying in 120° 40' to 124° East Long. (Greenwich) and 1° South to 1° North Lat. comprising the countries from the S.W. end of the Bay of Tomini, or the districts of Prigi and Dongola, to the kingdom of Mohondo, besides many islands in the bay and several districts in the peninsula Taliabo.

Contents.—This part of Celebes is divided into the countries of *Gurontalo, Limbotte, Boni, Bolangen* and *Andagili* (Antingola being incorporated with the last). These five countries are commonly designated by the general name of lima pahalla, to which also Moutton and Prigi formerly belonged, but which however are now independent of the Dutch Government.—The country is mountainous, with numerous narrow valleys and a multitude of small rivers. There are some large marshes on the sea coast. If not volcanic itself, yet it is undoubtedly connected with volcanoes, and therefore suffers from strong earthquakes. The breadth of the peninsula is from 22 to 40 miles.

The *climate* is very warm, but not oppressive nor unhealthy. Average of heat from September to November:

Morning	6	o'clock	69°	Fahrenh.
Noon ..	1½	,,	89°	,,
Evening	7½	,,	74°	,,
Midnight	12	,,	67°	,,
Morning	4½	,,	58°	,,

Fevers prevail only among the labourers of the gold mines in Sumalatte, Andagili and Pagowat. A disease of the eyes, which is frequent at Bolila, is said to be caused by the too frequent use of the warm baths there. Opium smoking increases every where to a fearful degree.

Mountains.—The island of Celebes is formed by the slopes of four large chains of mountains. Accordingly, the northern part, here under review, is traversed by a ridge of mountains, which on an average do not exceed the height of 2,000 feet, with the exception of a few points, viz., *Kabili*, near Boni, 4,000 feet, *Andagili*, near the town of Andagili, 4,200 feet, and *Gulahatto*, near Sumalatte, 5,400 feet. The mountains of the whole chain are steep, especially to the

north. The longitudinal valleys are very few; they are mostly transverse. There are therefore scarcely any plains: only three such are formed in the south by the strange concatenation of some side branches of mountains, viz., 1st. *the plain of Gurontalo* and Limbotte, in length west to east 16 miles, and breadth 5 to 7 miles, which appears to have been originated by the retreating of the sea, being only a few feet above its level; 2nd. *at Pagowat*, and 3rd. *near Moutton*: both the latter are mere valleys.

Of *Plateaus* only one is to be found, around the upper part of the river Pagogama, which is elevated about 300 feet above the level of the sea.

The *Rivers* are numerous, but on account of the narrowness of the island, only a few are navigable for boats to a short distance. The rivers which flow into the bay of Tomini are, 1st *Gurontalo*, being a discharge of water from the lake of Limbotte, flowing eastward and then southward, receiving on its left the Bothair and Bolangen, and attaining greater depth after being joined from the east, not far from the mouth, by the Boni. Small boats are able to ascend to the lake. 2nd. *Pagogama*, which runs from S.W. to S.E., has its sources upon and near Gulahatte, is narrow, deep cut, and with many rapids. Small boats go up as far as Tongabon. 3rd. *Pagowat*, from the north, very unimportant, is formed by the confluence of the Batu Dulango and Talo Duyuno. 4th. *Milandao*, running southward, from Gunong Bamwah, is of a considerable breadth, and navigable far up; it is very rich in gold, and not far from it are the mines of Wankahulu. 5th *Malisipat*, the most considerable of them all, runs southward, with many side-creeks, takes its rise from the mountains of Baol, and constitutes the frontier between Moutton and Gurontalo.

Among the northerly streams deserve to be named: 1st. *Andagili* from the mountain of Kasudipang, rich in gold, but otherwise inconsiderable. 2nd. *Quandam*, from Gunong Pintu besar, having a very crooked course, and navigable for a short distance. 3rd. *Lamatta*, from the slope of Gunong Marinsu, with waterfalls and rapids. 4th. *Sumalatte*, having its sources on the Gulahatto; near it are the gold mines of Sumalette.

Lakes inland.—The only one is in the plain of Limbotte, near the town of the same name; lying from west to east in length 4 miles; and in breadth between Limbotte and Bolemo, 2 miles.

Marshes.—There are some around the lake of Limbotte, some on

the north coast between Quandam and Sumalatte, and at the mouth of the Malisipat.

Salt pans.—There are very considerable ones, formed by nature, west of Milandao, but very little used.

Islands.—There is a large group on the north coast opposite the mouth of the Quandam, and in the bay of Tomini, among which may be mentioned as of importance for commerce: Una, Togian, Malinche, Walia and Matabella, upon whose large sand banks and cliffs a great quantity of trepang and turtles are collected by the Bajorese.

The coast of Celebes on the north, presents every where sands and cliffs; and is much flatter to the south.

Highways.—There are some paths for travellers on horseback between Gurontalo, Bolangen, Limbotte, Boni and Bolemo; also some paths over the mountains from Limbotte to Quandam, one of which leads right over the mountains Manga (2,000 feet), Pintu besar and Pintu Kechil; the second turns westward over Gunong Tiliule and Marinsu (at a height of 1850 feet). These paths are travelled on horseback, though they are highly dangerous. There are communications between Boni and Kayu Dipang, as also between Bolangen and Andagili, but these are only to be passed on foot.

Productions.—Gold, wax, pearls, turtles, trepang, cinnamon, coffee, (a little), cacao, birds-nests, horses, kapok (cotton from the *bombax pentrandum)*, kapas (cotton from the *gossipium herbaceum)*, kain (sarongs), salt, wood (of the latter there are some excellent kinds of iron-wood, Lingoa and Kamuni.)

Population.—There are probably no aborigines, or only a mixture of these with Bugis and immigrants from Ternate and Tidore. The number of the population is very small in proportion to the extent of ground. It is difficult to form a correct estimate of them, as the inhabitants are scattered here and there. Late accounts give, for

1.	Gurontalo.....	24,000	souls
2.	Limbotte.....	12,700	,,
3.	Bolangen.....	780	,,
4.	Boni	650	,,
5.	Andagili (with Antingola)..	350	,,
6.	Bolemo.....	300	,,
		38,780	

In this account Prigi and Moutton are not included, as the officers of government are withdrawn from thence. Prigi numbers about 3,000 and Moutton 1,750 souls.

The Revenue of government is derived almost entirely from the leasing of the Opium farms, and the profit from the gold dust, which, according to contract, the different districts *must* sell to the government for a stipulated price (viz. 14 rupees in copper for ½ tael, and 16 copper rupees for the gold from Gurontalo.) The whole amount of gold dust, which the lima pahallas have stipulated to furnish annually in this way to government, is the weight of one thousand Spanish dollars (or 500 taels.) This amount the five districts have distributed among themselves in proportion to the amount of their population, and some districts, not having rich gold mines themselves, are permitted to derive their complements from the mines of the other districts. Their separate allotments stand thus:

Gurontalo furnishes the weight of			400	Sp. Drs.
Limbotte	do.	do.	300	,,
Boni	do.	do.	80	,,
Bolangen	do.	do.	70	,,
Andagili (with Antingola)		do.	120	,,
Bolemo	do.	do.	30	,,
			1,000	,,

If we rate one tael of the gold dust at 80 Java Rupees, the revenue of the government will consist of the following items:

Gold dust furnished,.	40,000	rupees.
Rent of Opium farms,.	3,600	,,
Import and Export duties,. .	3,200	,,
	46,800	,,

The expense of Government may be taken on a fair estimation, to be the following:

1. Purchase money of the 500 taels gold dust,. . . . 15,500 Rs.
2. Salaries of an intendant (civile gezaghebber) with his clerk, of 50 soldiers under the command of a lieutenant, and of the Police Peons, about 10,000 ,,

25,500 Rs.

which will give a clear gain of 21,500 Rupees, which no doubt might easily be more than trebled, if more direct attention was paid to the rich mines and mountains.

The Commerce and Shipping, on the whole, is very trifling; conducted, with the exception of two or three coasters, solely by the Paduwakans or Bugis prahus, under the command of Arabs, Bugis and Chinese, never sailing against the monsoon. The commerce chiefly consists in the exchange of articles.

The *Imports* consist of European goods: cloth, linen, gold and silver galloons, leather, iron-goods, glass, earthen ware, silk, and sugar. The Bugis further import from Singapore, gunpowder, guns, opium, and from Menado and Ternate, rice and sago.

The *Exports* comprise gold, sarongs, cotton cloth &c., a kind of paper, kapok, kapas (in a raw state and worked), baskets, wax, cinnamon, wood, turtles, trepang, birds-nests, and horses.

Administration.—The Dutch have placed here merely a Civile Gezaghebber, who has to report to the Resident of Menado, and thus the country is a dependency of the Government of the Moluccas.

Native Government.—Each district has a chief, with the title of Raja, who is recognised and appointed by the Dutch Government, regard however being always had to their established customs. In Gurontalo and Limbotte there are two Rajas, the one is called Raja negri and the other Raja gobernement, the latter being introduced for the sake of equipoise against the prince. All dispatches of government are first transmitted to the latter, who afterwards consults with his colleague, and he alone is responsible for the execution of the order given. All other officers of government are appointed by the Rajah, who merely notifies the names to the Civile Gezaghebber. These officers are the counsellors of state or Juhugus and the chiefs of the smaller districts or negris. The Raja gobernement enjoys everywhere of course, the larger share of authority and respect, though the Raja negri has the precedence in rank. The Police and awarding of punishment belongs as well with the Civile Gezaghebber as to the rajas. Criminal cases are brought before the landraad (provincial court), consisting of the Civile Gezaghebber, the commanding lieutenant, and one or two rajas with other chiefs.

The *History* of these countries is given at length in Valentyn. In the thirteenth and fourteenth centuries they appear to have been still entirely unknown and unheeded. In the following century they were the subject of continual quarrel between Ternate and Tidore, who

succeeded alternately in obtaining possession. The conquest of Ternate and Tidore by the Spaniards and Portuguese, brought Celebes under European subjection along with them, and even at the present time the form and names of weapons remind us of the Spaniards, and places are pointed out by the natives in the wildest parts of the mountains, as having been visited by them. When their power decayed, these countries were recovered by Ternate and Tidore, until in the beginning of the seventeenth century the Dutch East India Company settled here. For a long time the princes remained quiet and faithful to their contracts; but when in the beginning of the eighteenth century, the attention of the Dutch was engrossed by other parts of the East Indies, and necessarily in a great measure withdrawn from Celebes, the old jealousy of Gurontalo and Limbotte broke out in a war, which had its origin in an uncertainty respecting the boundary at the town of Bolila. Gurontalo conquered first the fortress, situated at the lake of Limbotte, and then the negri of Limbotte, destroyed and burned all before them, and obliged the inhabitants to seek refuge with their princes, on the other side of the mountains in Quandam. Many ruins remain to this day as testimonies of this war, e. g. Kotta raja ect. Limbotte, notwithstanding, continued the war, and procured the assistance of the Bugis from Dongola and Macassar, who arrived with a large fleet, defeated Gurontalo, and then, as the Limbottians did not keep their promise, turned against them, ransacking and burning the country.

Both countries were now fain to regain again the protection of the Dutch Company, and the former contracts were renewed and extended. The Maatschappy then build the forts at Quandam and Gurontalo and installed the two Rajas gobernement. In these latter contracts the contributions of gold dust were stipulated, and the country became a dependency of the administration in Menado.

Religion.—From the time of the invasions of the people from Ternate, heathenism was superseded by Mohamadanism, which spread over the whole country. After this the Spaniards sent their monks, and the Dutch their protestant teachers, and many converts were made. But in the end of the last, and the beginning of the present centuries, the religious interest was neglected, and the whole communities after repeated, but unsuccessful applications to the Dutch government for a new supply of Christian teachers, fell back again into Mohamedanism, as for instance the negris Kayu Dipang, Bolangin, Antingola and Boal. The Hajis however have no great authority,

being mostly natives, of the caste of Bobatus. A few of them are Arabs and Bugis, who live here for the sake of trade, and are at the same time priests and merchants. (Vide the new Dutch periodical, *Tijdschrift ter bevordering van christelijken zin in Nëerlands-Indie*, printed at Batavia.)

Division of the population into castes.—This is uniform in all districts. It was probably introduced from Ternate and is strongly adhered to, having been established for centuries. Three classes are chiefly to be distinguished, 1st. *Bobatus*, or patricians, 2nd. *Balla*, the middle class and peasantry, 3rd. *budak*, slaves. The latter class comprises, *a*, *Mangofuli*, i. e. the slaves of the community, who are almost free and of the same rank as No. 2, and *b*, the slaves of individuals.

All higher offices and posts of honor are monopolised by the Bobatu, viz., *a*, *raja*, chosen from the oldest families; *b*, *Juhugu*, counsellors or ministers—in Gurontalo and Limbotte three, in the smaller states two; *c*, *Capitan* laut, or Admiral; *d*, *Walopulu* or chiefs of larger negris or communities; *e*, *Marsaoli*, these, although the filth in rank, have the greatest influence, being the chiefs of villages, and in this capacity at the same time representatives or tribunes of the people. They are chosen exclusively by the *balla* and the *mangofuli*, or by their joint deputies, the Kimelaha.* The Marsaoli have thus become in some way the lawgiving body, while the raja has the executive. In former times the Marsaoli had the right to appoint and to dethrone the raja, and even to try him for life, if he outraged the law. Their persons are in a certain measure sacred; only the Kimelahas have the power to deprive them of their office; the Raja not being allowed to meddle with it. In Gurontalo is besides another post of honour with the title of major, which was formerly also an exclusive privilege of the Bobatu, but is now occupied by a Balla.

With the *Balla* rests all the burthen of taxes, tribute etc. Their deputies are the Kimelaha kiri, who chose the Marsoali and constitute his council. Amongst this class are ranked besides the *Kapala soldado*, i. e. the children of the Bobatu by slave-women; but in case of deficiency of legitimate children they may be adopted by their father, and they then enter into all the rights of Bobatus.

* The Kimelaha are distinguished as Kimelaha kiri and Kimelaha kanan, the former are the deputies of the Balla, the latter those of the Mangofuli.

Generally out of the number of the Kapala soldado a life-guard for the princes is selected, and hence their name.

The above mentioned title of *major* in Gurontalo, is given to four different officers chosen from the Balla: *a*, the Adjutant of the Raja; *b*, the Police-Magistrates for inspecting the passars etc.; *c*, the Overseers of estates and gold mines; *d*, an undefined office, an empty title, given generally to the sons of Bobatu's, in order to secure to them some authority and emolument.

The *slaves* form the largest portion of the population, and their condition is not oppressive. There are several subdivisions: 1st. *the Mangofuli* or *Mangohuli*, who are very numerous, and not properly slaves, but independent, excepting some feudal services for the good of the community, which they have to discharge, and which are transmitted from father to son. Lately a great number of them were incorporated with the Balla. Their deputies, are the Kimelaha kanan. 2nd. *Buda pusaka* (slaves by inheritance.) These live entirely with their master and his family and work for them, having become slaves originally by debt and inability to pay it. 3rd. *Buda*, common slaves, captives made in former wars, and their descendants, very numerous; they may be sold or given away, but not into other countries and provinces.

The following custom in Gurontalo is very remarkable: if two slaves of two different families beget children, then their offspring becomes the slave of both families, staying alternately equal periods with each family, as a mutual arrangement. Further, if a slave of two or more families marries the slave of other families, the children become the property of all the different masters of their parents. Thus one female slave was found working in 16 families, changing her abode every week.

Manners and Customs.—Owing to the mixed character of the nation, consisting of and influenced by Ternateans, Tidoreans and Bugis (the latter especially in great numbers), it is difficult to discern distinct peculiarities. We speak first of *Dress*: the princes and aristocracy imitate the European dress, with the exception of the head dress, considering very justly the turban or handkerchief much more convenient. The *middle classes* dress entirely in the Bugis fashion, and display great luxury, wearing very generally silks and costly kinds of cloth, richly bordered and covered with gold and silver-laces. The sarongs, of the very finest kind, are fastened round the waist by belts, not seldom richly ornamented with gold

and diamonds. But especially great is the extravagance in weapons. Instances are known, where 120 Sp. Drs. have been paid for the wooden scabbard of a kris, and common rifles are exchanged for gold dust to the amount of 300 and 400 Rs. Among such articles of luxury, the apparatus for opium smoking has a prominent place: the pipes being of embossed gold, silver or ivory. The *dress of the lower classes* for the men consists of short trowsers of cloth; the upper part of the body is generally naked, but sometimes jackets with short sleeves are used. Besides there is commonly a sarong wound (folded in the manner of salendangs) round the waist, which serves as a cloak in cold and rainy weather and during the night. The head dress is either a small cap, made of rattan, or a handkerchief, negligently wound round the head, with one end hanging loosely down. There is besides in use for protection from rain and sunshine a large hat, made of sago leaves, named Tollo. This class is mostly armed with the kris, tombak and parang. *Dress of females*: those of the higher classes are just like those in Java, transparent stuffs with gold and silver textures, and plenty of ornaments of gold, silver and diamonds. But in domestic retirement all splendour and ornaments are laid aside, and filth and sloth are the order of the day. Nothing but a sarong of coarse and generally dark coloured cloth is bound round the waist, and perhaps a piece of black crape is thrown over the shoulders to cover the breast; but this is scarce, and commonly at home the princess is not to be known by her dress from the lowest Gurontalo woman. Sometimes the females wear short jackets, white, yellow, green or blue; but this is not frequent, as it is generally the dress of slaves. The poorer classes are content with rags of the bark of trees.

The home, domestic relations, property etc.—The life at home is worse than animal existence, almost mere lazy vegetation. *That of the lower and poorer classes*, the Balla, is especially wretched. Their chief characteristic is blind obedience to their superiors, not from any voluntary motive, but from cowardly submission; and not having any security for their persons or property, of course every spark of energy and activity becomes extinguished, as it is preferable to suffer the bitterest want rather than toil for gain, of which they are sure to be robbed by their indolent but luxurious oppressors. The further consequences are but natural, that this consciousness of their helpless condition, renders the character of the people dark, distrustful and repulsive, and that instances of dishonesty and perfi-

diousness are frequent, prompted by the desire of enjoyment, which looks only to the present moment. The dwellings of the Ballas are miserable huts of bambu, standing on some high posts, consisting of one room, which at the same time is lodging, kitchen and store. The furniture consists of some weapons, mats, siri-boxes, a pot for cooking jagong or maize, and a cushion, i. e. the saddle for the horse. Any garden or plantation around is immediately neglected and left to desolation as soon as the harvest is brought in. Some who are richer have buffaloes, sheep and goats, but without deriving much profit, as they are ignorant and careless of breeding cattle. The occupations of the men are; the cultivation of their small farm, fishing, and digging for gold. Every spare moment is devoted to opium smoking, cock-fighting, gambling, and sleeping. The occupations of the women are more numerous and heavy, as besides all the domestic labours, they have to gather in and to sell the produce of their farm, to weave cloth, and to nurse and attend to the children. Thus here, as well as almost every where throughout the Archipelago, it is the custom that the wife has to support the husband, and hence it is that polygamy can exist without much jealousy. On the contrary the wife rejoices to see a new wife introduced into the family, as she thereby gets assistance in providing for it; and whoever therefore can afford it, surrounds himself with a whole herd of gundik (concubines).

The richer classes as regards domestic life, are in all respects like the poor. Their dwellings are just as dirty and wretched. They are only distinguished by dress and by greater laziness. Like the owls, they are properly alive only during the night. Immoderate sensual enjoyments and opium smoking enfeeble and enervate the body and soul. All labour is left to slaves, whose number is so enormous, that some are proprietors of more than a thousand slaves, to whom are appointed the several tasks of agriculture and weaving of kapas and kapok. If ships arrive, all the produce is collected, and bartered for the necessary articles. Among the furniture in the houses of rich people are commonly some chairs and tables, kept for the more ceremonious visits of Europeans, but dispensed with as soon as acquaintance and familiarity are established. The partition walls of the several rooms are nothing but curtains, which give to the whole interior a pleasing look of comfort. If you are on a friendly footing with the master of the house, he will, to welcome your visit, scarcely raise himself on his elbow from his soft and

luxurious bed of mats and cushions, but will immediately order an opium pipe (Famadupa) to be presented to you, and alternately coffee and tea with large supplies of comfits. The natives of Gurontalo carry their own bed and opium pipe with them on every visit. Even a visit to a neighbouring house perhaps not more than 100 paces distant, they perform on horseback with at least three followers, one to carry the siri box, the other the Famadupa with appurtenances, and the third the mattress. All important matters are discussed with the assistance of opium, which makes the otherwise taciturn native highly communicative, and all resolutions come to in such consultations under the influence of opium are considered almost sacred, and strictly adhered to and executed. Both sexes are addicted to the use of this drug; what polygamy undermines, this poison utterly destroys, and even the present generation is an exhausted race of men, rather walking skeletons than flesh and blood. The privileges of the prince extend to the marriage bed of his subjects. If he choses, the first embrace is his, and the parties concerned think themselves highly honoured by such a visitation.

Food, plays, feasts etc.—In eating and drinking they are very temperate. The chief articles of food are: sago, jagong with fish or dried buffaloe flesh; among the rich besides rice and fowl, and a great quantity of comfits, coffee, tea, and honey are used. The whole nation is fond of music and dancing; but both are imitations of the Javanese. Playing at cards (Chinese and European) is every where known and practised; vingtun especially is understood in spite of the Dutchmen. But particularly popular are Chinese plays and cock-fighting, the latter usually attended with high betting, and great excitement and noise. Horse races and rival rifle shooting are occurences of every day. The whole nation, even the females, are passionate riders, and display their skill on all public occasions.

Of public representations of combat there are several descriptions, and for the most part with costumes and weapons of former times.

1st. *Langka*, single combat: one opponent has a dagger, the other is without any weapon and is attacked by the former, merely defending himself by strength and agility. His great aim must be, to get hold from above of the hand with the poniard, and thus to prevent or even to return the thrusts.

2nd. *Mancha*, single combat. One combatant armed with the klewang or gollok (vide Raffles' history of Java), the other with a spear. The two combatants approach each other dancing and

chanting war-songs, leaping continually in circles round each other, in order to get the glare of the sun or the breeze against the adversary; for it is then that, the adversary being blinded by the light or the dust raised purposely with the foot, an attempt must be made to attack him unawares from a side where he does not think his antagonist is. Extraordinary celerity in thrusting and parrying is generally displayed, and frequently the combatants get so excited and furious, that it is with the greatest trouble they are separated in order to prevent a deadly issue.

3rd. *Rangko*, single combat; both combatants are provided with a shield, long and narrow in the middle, but becoming broader towards both extremities, and with a klewang. This combat seems to be more national and original than the other. Generally both the champions are dressed in red jackets, similar to those of the Spanish soldiers. The head is decked out with a black turban, with gold tinsel and some long feathers. They squat down, sitting on their heels and covering their whole length with the shield. In this position they approach each other, occasionally taking a long leap, either to attack or to retreat, and then again cowering and creeping. Their knowledge of fencing is admirable, striking and warding with lightning quickness.

In such festivals there are not seldom seen currasses, partisans, foils, helmets etc., which are said to have belonged to a primeval generation of the island, who made distant excursions and conquests by sea in large fleets. Private entertainments and festivals are made pompous by the display of great numbers of slaves. Many other customs are just like those of the other islands with Mahommedan population.

Industry.—The extent, fertility and riches of this country would warrant us in attributing wealth to all the inhabitants, and yet they are miserably poor. Industry and art are still in their first stage of childhood. Are there some more industrious, they are sure of becoming a prey to the avarice of the princes. Frequently therefore whole families seek refuge in remote parts of the woods and mountains, in order to live in an independent patriarchal manner. An increase or an improvement of their industry is thus not likely to take place.

Breeding of cattle would easily succeed, but only horses and karbaus (buffalos) are attended to; both are in great plenty, and the former are an important article of export. Not so much their beauty, as their fleetness and strength is made the point of consi-

deration ; the highest price fetched by horses, is 700 rupees. The trade of horses has decreased much of late, as many mares have been exported, which has enabled other countries to establish studs for themselves.

Agriculture is entirely in its infancy, as jagong, and very little rice and sugar cane only are raised. Large tracts of the most fertile ground lie entirely waste. The plough was introduced after the war in Java (1830), because the auxiliary troops from Gurontalo became acquainted with it when there ; but it is still not much used. Coffee and sugarcane they would scarely ever be induced to cultivate, as even those necessaries of Indian life, beetle nut, siri etc., are so little planted and taken care of, that they are invariably unreasonably dear. There are even instances of fruit trees having been cut down, in order to save the trouble of watching and reaping the fruit! Of all kinds of fruit therefore there is the greatest scarcity.

Cinnamon, kapok and kapas, although in great abundance, are only so far attended to, and used, as absolute necessity compells, and it is the same with all those invaluable kinds of *wood*, in which the forests abound, especially Kamuni, and Nanni, and Ham, and Mera, and the different species of the Lingoa, and the iron wood etc. It is the same with *salt*, which could be furnished to any extent. And finally it is the same with those millions of treasures, which nature has bountifully laid up in the bowels of Celebes.

Manufactured articles.—1st. sarongs of kapok or kapas, differing in fineness and beauty.

2nd. Cloths made from the threads of white European linen, which is ripped up, the thread detached, beautifully dyed, and then woven again.

3rd. Kabayas or bajus and kerchiefs, fine and durable.

4th. Yarn or twine of kapas and kapok.

5th. Articles of gold and silver, neat but without particular taste, mostly siriboxes, girdles, bracelets, combs, pins, handles of krises, and the implements for opium-smoking.

6th. Articles and carvings in wood, few and unimportant.

MALAY PANTUMS.

اسف افي امبون بردري
نيت هاتي تيدق برچري

فاته گاله ددالم فراءو
كهندق الله سيافاكه تاهو

سوڠي دامر جاڠن فادم
كالو توان انق چوچو ادم

كوه دمڠكوء جاڠن تمفه
خبر سفاته جاڠن بروبه

بورڠ اجي تربڠ كاءجي
بارڠسيافب مڠكيركن جنجي

تربڠ جاوه ترلالو فنت
هيدفن تيدق مندافة سلامت

اندرڠيري كوالان امفت
كسان سين منچاري تمفت

امفت٢ تروس كلاوت
باڠي عجل دتند ماوت

گاله سباتڠ دبله بله
جكلو دانڠ كهندق الله

دايكت ايكت رندام كفاي
سيافكه چاكف ملاڠ دي

منجاڠت روتن دتاريك٢
ايڠة٢ جاڠ بدان بايك٢

جاڠن لوكا تاڠن سندير
بوله ترفايهرا بدان سندير

كفيندير دسمبر هلڠ
داڠڠ ترسلت دكمفڠ اورڠ

جاته كدءيرا اندراڠيري
تاهو٢ مهماوا ديري

سڠكواڠ كايو فتاتي
تربواڠله داڠڠ سهيا اين

تمبڠ ترسندر دكايو كلت
باڠي ايكن دلوار بلت

چمفداء تومبڠ چوندوڠ
جكلو تيدق امس دڠندوڠ

دكرة اورڠ دبوت تاكل
صحابة كيت فون تياد مڠنل

MISCELLANEOUS NOTICES, CONTRIBUTIONS AND CORRESPONDENCE.

LETTER FROM THE INTERIOR OF BORNEO (WEST COAST.) NO III.*

Karangan, July 10th, 1848.

THE importance of "proper names" leads me to notice that my signature as printed in the March No. lacked an "*n*" to close its third syllable. KALAMANTAN is the name of our young continent, and I presume the correction has been made by yourself; the word radang (or, in the true Dyak radakn) was printed sadang, and the name of the orchard requires a final "*n*". Since this matter is open, let me say a little in reference to differences between Malay and Dyak. The class of words is by no means small in which the body of the syllables is quite the same, and the last two letters of the word "*kn*" in the one case and "*ng*" in the other—the Dyak being the harsher. In another class ending in *n* in Malay, a *t* is often found before it in the speech of the other people; the Dyak uses it thus in the already long enough name of his island-home. In the name of the moon yet another change occurs as *buratn, bulan:* who made the change, and when? Malays here, sometimes turn *r* into *l*, and among Dyak *children* it is not an uncommon affectation to make a *y* of it, as *bu-yatn.* According to all rule, we should expect to hear a Dyak call corn, jagokn, but, that being his name for a deer, he uses the Malay form; and, if one of this people were a schoolmaster, the terror of his boys would be, not rotatn but *wi* (pronounced *we*). A few words from Malay to which the rules above alluded to will apply, are the following, though perhaps I may have given

* We greatly regret that want of space compells us to omit the first page of this letter. We have contributions in hand that will fill several numbers of the Journal, and the only way in which we can attend to the claims of all our contributors on the one hand and those of our readers on the other, is by occasionally omitting passages which relate to subjects not strictly within the province of the Journal, and condensing papers that may be somewhat diffuse. The valuable or interesting but hitherto neglected matter which our field includes is so ample and varied, that, to give room for all who have so zealously and ably taken part in our work, each contributor will, we hope, recognize the propriety of some degree of conciseness in style.—ED.

them before viz., pohon, (very commonly printed Bohon in the west, in connection with the "poisonous tree" fable), *orang*, *tumpang*, *kajang*, *papan*, *lilin*, *kain &c.*, *jalan* (the noun) stands with precisely the same difference as *bulan* viz. *jaratn*, and its place as a verb is filled by "*maran*" *tangam*, *tangga* become "*tangapm*", "*tanga*", the Dyak omitting second "*g*": *rendam*, "*reuncupm*"; *patang*, "*patakn*" or "*pentenkn*" (some word for stomach): *datang*, "*entenkn*", "*atakn*. As to a more general vocabulary, should I see the former list,* I may offer you an addition; sooner, I could not safely. In speaking of their habits I have no recollection of alluding to the fact that we hear little of gross profanity: an asseveration of his own veracity has been heard in the form "may I die under curse, &c." but, probably from the fear that such language or that of obscenity would injure their name in reference to a selection of men for employment, neither is at all prominent directly near us, i. e. when the speaker knows he *must* be heard. As a deer is the largest animal that almost any of them have seen (with the exception that a horse passed, possibly is still passing, his last days at Landak), the names of the elephant and buffalo are in constant use as exclamations of surprise or banter: the former, with emphasis severely laid upon the second syllable, is the favourite, though it is common to connect the two in as rapid pronunciation as possible, the buffalo taking precedence when a finish of great power is desirable. As to food, the snake, the monkey and the dog are prized, though there are those who have learned a shame on the subject, from their fellows of the other race; and a basket of ladang rats I have seen counted out in triumph, to the number of nearly 60. Nothing is to be named in comparison with the wild hog, distinctively call *kais*; the domestic, *wè*. In reference to the most active and successful Dyak at the nearest village, the following is related. To him the eating of canine flesh was *piri* (pantang of the Malay), and he has sought release from the oppressive restriction in the mode following, and with the chances certainly about equal. Time after time, have two bundles, the one containing charcoal, the other a portion of the coveted meat, been placed upon the surface of a rice-pan, *daku*, and ceremoniously turned about for a given time by a friend desirous to see him *free*. During the operation he of the longing lips is seated, gazing submissively downward, while the twirling goes on above his

* This list has been mislaid, but we hope to be able to give it in our next number.—ED.

head: at length, all is ready, and still looking downward for fairness' sake, he raises his hand slowly, for it is a moment big with consequence, and the parcel that first meets his hand determines his liberty or bondage. Poor man, he has always encountered the charcoal! Another word as to speech: in some of the specimens the words, though possibly all used by some one or another person in Karangan, belong in some cases to neighbouring districts. The custom of the country expects the husband, just made, to settle amid the scenes of the wooing, and thus the maiden imports a dialect almost certainly differing from that of her village. Not far hence (say 3 hours), is a point which, for the nonce, we will call central, and at which British railroad speed would collect from the four winds, in half an hour, nay 15 to 20 minutes, men who, in answering a question with "I have none" would produce this medley among them, *mak*, *aja*, *langit*, *dade*, *ajeu* and *kai bisi*: here, *mak* expresses it, and *kai* is the simple "not" to travel with a verb, as you have just seen in the last of the six. The list is easily extensible, on information, but I name only those that are at the end of a half-day's radius from us, at farthest. In one of these villages, an old woman startled my ear with a sound quite long unheard, but distinct as could be wished, though bodied forth in the voice of cracked complaining. The white tourist and his two burden bearers are held to possess, among the baggage, all that the variant tastes of mendicant poverty can well name in the course of a noon-day call. Where a halt for the night is made, the expectants have time for a judicious rumination and leisurely approach to a subject. This dame, whose wiry hair, from appearances, might have been studiously elfed for a terror to the infant department, came tottering to the semi-circle, with her only not empty, because excessively filthy boxes, repeating with a whine, "apoh ajeu, wai ajeu, wit ajeu, charia ajeu, *baccè* (pron. bakkè) pan ajeu", and, could you have seen the covetously blear eyes, the chin excited to triphammer gallop and all the detail of the "mise en scene", hesitancy would have, for the moment, felt like guilt, could you have supplied, but refused to do it, the withered hands of the poor old woman who droned "no lime, no betel-nut, no sirih, no gambier,—tobacco, even, none." The resemblance to the baccy of an old negress devoted to her pipe was close and notable. And now, for a rapid pen will ramble hither and yon, and again I justify on the ground that I am not compiling but letter-writing, with a free rein given to association and memory,—let us put down, in few words,

some superstitions: *many* words, it is to be feared, must utterly fail to put them down, except in this mode, while their hearts and hopes are Time's only. They pay great respect to the warning of the "curse bird" whose quick, single chirp, heard on the right or behind him, will arrest the walk of the traveller: even if going on an errand of some consequence, he tŭrns back, but he may on another day try again, and, if the bird then also forbid his further progress, he may settle the matter with the *burukn tulah* (or burong kutok of the Malay) by producing a small skein of seven strands (which, when the true article, has its upper ends enclosed in a silver tip for the fingers), freeing it from entanglement and suspending it in the grasp of two fingers. If a strand fall to the ground, he may not go forward at the hazard of illness or calamity, if two or more, it would be madness even to cherish a wish foreign to submissiveness. In the case of a trader, it is said that *only* the chirp on the right is adverse, whereas from the left comes the omen of great demand, and, if he have but a small stock or variety, he may expect dissatisfaction from the people, that he came so ill-supplied. In the case of the test just mentioned, it is presumable that the issue accords with the preference of the party using it, and, in a matter of no moment, any good Dyak would certainly sometimes give the bird his way, and return to the village, the object of interest for a few minutes while friends should inquire just where it happened, &c.; 'tis a pleasant tonic to a lazy group who had nothing new. On our little stream, within a mile of our premises, at the place where Karangan's seat was in the day of her glory, when her lawangs were more than five fold their present number, and, if a Malay dared tie his boat above or abreast of the bathing place, its fastening was promptly cut at sight, may be seen the trunk of a bungur tree to which attaches a tale of pride. One of the old residents of the chief radang (these were 5 or 6 buildings, containing 180 doors,) intending to build, perhaps a granary, had cut and shaped his ni tas (tiang bilian,) and, bringing them to the spot, placed them, resting on end, against the bungur, with intent to raise his building on the morrow. That night the bungur so thoroughly devoured the bilian that the early morning showed but the ends of the latter, projecting proof upon the skeptic; wherefore, divers counsellings and resolves resulted, and the bungur was fitly held a sacred tree, in reference to which no "Morris" needed to indite an affecting and popular "Woodman, spare." Time brought age and loss of vigor, and the tree of prowess,

the pride of the "*ano samaia*" (olden time) fell, formidable even in death, as an obstruction to the traffic and facilities of the stream. And now, no Dyak's "bai" or "usi" (parang or biliong) might touch the fallen monarch of the depa (river bank,) no dog might set his foot upon this convenient bridge, though, with houses on either side, and hundreds of those hunting animals, great was the vigilance required. At length four deer-eating Malays, actuated by the spirit of mammon more than of reverence, proceeded to make a way for their boats by hacking slowly through the still majestic bungur, Karangan the while aghast and stifling her indignation, to indulge her sadness at seeing poor mortals dealing destruction thus upon themselves. Unhappy men! their work completed, they sprang into their boats with a jeer at the bungur's honor, to pass the spot no more for ever. Sickening at a village, 3 hours distant, all perished miserably, and fathers, pointing to the unused and decaying prahus of the infatuated men, impressed upon their sons that that honor was avenged! To the trunk of that tree still go the descendants, proud as poor, of those who were of property and might in other days—the swine of sacrifice is offered and devoured, and the eye of the boy Dyak gleams as he follows ambitiously, with the eye, the practised dance of the "notong" ceremony, a Chinese skull dangling from the dancer's hand. The dance is, for the most part, a slow twisting of the limbs and trunk, and when two or three well dressed parties take the floor at once, there is a rude gracefulness in the evolutions: tinkling bells are attached to the ancle, and about the hips is affixed a hoop from which a sarong floats about the person, to the knee: these are the males. Music of deafening clangor, and unbounded license of gesture and expression rule the hour, though I may repeat the remark that *we* are allowed to see and hear very little of such open vice. I once was present with a party (none of whom had, perhaps, seen one of their assemblages for festivity, it being my own first occasion, also,) at a harvest dance after the crop was housed, and on that occasion several men wearing masks, and apparently *disguised*, also, by a free use of "tuak" (arrack,) were excessively shameless. At a war-dance, last year, thinking it well to know its characteristics, I spent a few minutes, but there were no masks, nor was any conduct other than their best observed; a half skull was then used, having been procured from another village which had sent a small party to the war with the Chinese, a year or more since. At the conclusion, one called out to his friend to know

what I thought of it, as I had been closely observed while questioning him as to a few items; but, before *he* could make a reply, another answered, from general knowledge of our principles, "dosa, ujara." "It's *sin*, he says": of course, it was said with a made up mirth from the speaker, but no other joined him. If a Dyak, in travelling, sees the fall of a dead tree, he may not go forward, evil is before him; and I am told that a case occurred, a few months ago, confirming the people in their tenacity of hold. A Dyak, going with our Malay washerman to Pontianak in April last, witnessed such a fall, when a few miles only from this place, and expressed his fears repeatedly; a few days were spent at Pontianak and on a wedding occasion, which the Malay had gone down to attend, his father's house was burned. It is observable that the two races, as represented here, are about equally credulous, nor am I sure that many of the Malays are not far more obstinately blind in their enslavement. A Dyak *can* shake off his superstition when travelling with us (I do not speak of all,) and I have myself determined an issue against the "burukn tulah" without looking up seven strands, or in any way canvassing the matter; nor have I any doubt that the man felt more force put upon his *back* (in being required to remount the basket he had set down in affright) than upon his *conscience*. So, too, with their law imposing a fine for chopping wood as a white man would—said law requiring one stroke oblique, the other, vertical: hewing out a V. is punishable if an informer will act in the case, but I have known two, who could trust each other, to take the shorter course. If however, a large trunk, or small one, were so cut and left, so that other Dyaks should see the proof, inquiry would be made, or, if none would incur the enmity of the guilty one by ferreting out the doer, all passers by would instantly note the innovation, and wonder who had done it. Except, however, in preparing ladangs, they never cut a log, here, but for wages: if one obstructs the river they tell us of it, and are, in such case, glad to clear the stream, for their own use chiefly,—the intervals of rest being doubly refreshing, when working by the day. No person can have failed, I think, to observe the powers of observation manifested by the hireling to whom the shadow of the sun is a chief interest—what topics of conversation spring to mind, if two be working together; and, if the employer draw nigh, how respectfully they court a few words with him, in hope that one subject may attach yet others to itself,—how desirous, should a leaping fish or a passing swarm of

hces arrest attention, to connect a tale therewith, if it be a time at which Tuan seems at leisure. Hemans' words to death might be applied to the Dyak working by the day, "thou hast all seasons for thine own." If he wish to talk away time, the remedy is as easy by a smile at his art (he cannot bear that,) as by leaving him in a quiet way; I would do neither, unless the conversation were evidently *mere* pastime: the true method is to give *our* Dyaks job work, or allow them to take their own course, and judge, at each day's end, by an average standard; if justice be done by discharge for neglect, shameful trifling will rarely occur until the man may have money enough for present purposes, and even then a regard to the future may secure an ordinary conduct. It is remarked by the Malays *that they themselves* cannot do here what is of easy execution among almost any others of the race in this part of the Island, though it is plain that, as a rule, their terms are harder to the Dyak and easier *from* him than we uniformly use in buying from them and hiring their labor. Their wages, five pence sterling for such work as theirs, are large, and, at that rate, the man who works upon the Mission site *about twenty days* may at harvest prices, buy padi sufficient to yield rice that will be food for himself *throughout the year*: the very facility of living in some way, is a canker to their energy, in sadly too many cases. I, this moment, hear that a boat is to go very soon to Pontianak, and must close abruptly, to finish other missives.

KALAMANTAN.

LETTER FROM LIEUT. COLONEL LOW WITH REFERENCE TO THE REV. MR. JONES' NOTES ON THE TREATISE ON SIAMESE LAW.

Province Wellesley, 18*th Sept.* 1848.

I feel pretty certain that your contributors, while writing for your Journal, are guided by an earnest desire to elicit truth and not by any paltry ambition of exhibiting themselves in print. I am led to these remarks by a letter of Mr. J. T. Jones which was published in your July No. [p. xxxii] in which he passes some comments upon my paper on Siamese Law. No one can complain of criticism conceived in a right spirit; nor shall I. Indeed I feel obliged to him for having given me an opportunity of correcting either commissions or omissions.

More than twenty years have elapsed, since I paid some attention to the Siamese language; not on its own account, since it is rather unattractive to an European or an American,—but because it appeared at the time the only mode by which any real knowledge could be gained of the country and its people,—and a dozen years at least have passed away since I left off reading Siamese works, so that I am now somewhat rusty in the language. I wish, however, to make this preliminary and general remark, that Mr. Jones may rest assured that had I perceived the least prospect of the subjects regarding Siam, which I have at various periods ventured on, being handled by others who had better opportunities than I had of elucidating them, I should certainly not have adventured, under a good many, and what Mr Jones is pleased to call "*complicated*", *disadvantages*. That is to say, that in so far as *oral* information went respecting Central Siam I had to depend on such Priests and other Siamese as visited Penang. I am doubtful at the same time whether a residence in the capital would authorize any writer confidently to pronounce on all of the customs, extant in the Central and Northern or Upper Provinces. In large cities, country or provincial manners and customs can scarcely survive a limited period. The natural abrasion of a crowded people, with refinements, and foreign intercourse, will soon render the features of the society of a Capital no guage of those of the Provinces. Unless therefore Mr. Jones personally visited these Provinces he must excuse me for observing that he has been labouring under disadvantages similar in kind, although doubtless far less in degree, than those I have had to encounter.

Mr. Gutzlaff observed "that the acquirement of the colloquial dialect of the Siamese language is difficult for an European *ear*," to which I must respond, and to which I must add that unless one is gifted with both a good ear and glottological flexibility the true enunciation of many of its sounds will be equally difficult or perhaps, unattainable.

Mr. Jones finds fault with my short u. It is indeed true that the Thai Alphabet has no separate and *precise* letter to express this sound. Neither has the English. My instructor in the language was a native of Bankok, and to my ear this u as in run, cut, utter, lump, but &c., is the same as the Siamese vowel in the words, mun (lú)-ung, ro-um, (mu-)ung, un-(nung), &c. But Mr. Jones does admit that there is a sound which resembles it when followed by n final.

My broad a was not intended for the *short broad* o, as in *modify* not, hot, &c., but to express the broad German and Scotch sound as a in fall, wall, all. Mr. Jones denies that there is a French u in the language although the Siamese have, he admits, sounds which bear some slight resemblance to that of the French vowel, but are far from being identical with it. I will not argue this point; but only observe that since he has told us what this sound is *not*, we could wish that he had shewn what it really is. I confess my inability to pronounce this vowel in many words, either when long or short. I would suggest for experiment, the words pún (gun), prasùt, lùat. At any rate the Siamese alphabet has two distinct marks or sets of marks for this non-descript vowel, being the 5th and 6th in order, thus ù short and ú broad.* It is occasionally guttural, at other times drawled out as in un-prasùt.

When I remarked that the Siamese seemed to have no distinct *Bali* Code of Civil and Criminal Law, I certainly did not by any means wish it to be inferred, as Mr. Jones has done, that I had overlooked the D,hamma Sàtr, which, as far as I know of it, is a religious not a Civil Code.

I am not answerable for Dr. Leyden's titles of Codes. My paper alluded to was compiled about 1825, and I have not had an opportunity of correcting the Press. The Codes from which I drew most of my information have been perhaps loosely transcribed by copyists. The Bot or Thet P,hra Ayakan was presented by me to the Royal Asiatic Society in whose Museum it doubtless remains.

Mr. Jones has very properly corrected the error of T,ho sok having been explained as denoting two years of a century, instead of being two years of a cycle of twelve years. But this mode of computing is merely to assist the memory by a subdivision of time and has no effect on any actual era. It is evidently of Bali or Brahmanical origin, from the Indian numerals being employed.

Mr. Jones states that the Buddhist Era (of Siam) has now reached the 2399th year, and consequently differs from the Christian Era 551 years. I am not aware that the Siamese have ever disclaimed Ceylon as the fountain head of their faith, quite the reverse. I have always understood and been told by their Priests that their religious era and that of Ceylon and Camboja are identical. Now the Cey-

* The want of Siamese types obliges us to omit the characters which Colonel Low here gives.—ED.

lonese era of Buddha dates from B. C. 543,* consequently the difference betwixt it and the christian era would be 543 years instead of 551. The Sakkarat T,hai or T,hai era sets out from the fifth month or 21st. day of March, and, as the Siamese say, tamra du chatani khit Sakarat Th'ai te kon (or kā'n) P,hrā Chau dù-an nùng kap sip ha wan, signifying that the T,hai era is for astrological purposes, and sets out from a period of one month and fifteen days previous to the Buddhist era.

The chief civil Siamese era or that of Phriya Krek is I suspect an Indian one; however as M. Cassini acquaints us, it dates from the 21st. March 638 A. D. which would make the period up to 21st March 1848, to be 1210 years instead of 1209. Wilford in the A. R. B. informs us that the Gaga Vasishta or Guso Bosatz of the Javanese is "he who abides in the frame of an elephant called Sri "Hasti Sena and who ascended A. 636 of the Siamese ree koning "and 1036 of the Janias."

I have not, as I before said, that MS. by me but if the date be 1596, as before noticed, it must relate to the T,hai era, not to that of Phriya Krek, consequently from 2391 [21st March, 1848] deduct 1596 and the date would be 795 years ago, or about A. D. 1053. The number 1055 may have been some clerical error. But it is immaterial to the object for which the M.S. was translated by me. The date of some important event appears occasionally in the Buddhist era. Thus in a compendium of the Siamese Laws part of which is in my possession entitled

Kot P,hrä Ayakan

the Era of Buddha is employed, and the date is 2155—ben ya sok or A. D. 1612.

P. xxxiv. Bet set may be a proper correction for the Bái set of my MS.

Mr. Jones is also quite right as to the meaning of Trai P,hom, being earth, heaven and hell. As to Niphan every one at all acquainted with Budhism knows its import.

P. xxxv. Mr. Jones appears singularly to have overlooked the *sarcasm* implied in my remark respecting the *care of souls* being intrusted to Priests of P,hunga. But a stranger to Siamese institutions might feel equally amused by *his* (Mr. J.) telling us that from one fourth to one third of all the male Siamese are Priests. It

* Mahawanso Translation p. 9.

might indeed raise an immediate question how any nation could possibly long submit to such an Atlas pressure upon its resources. But Mr. Jones I suppose includes all the Chau Nen or noviciates under twenty years of age, and if so, and as these do not all take holy orders, a large deduction might be made, still however leaving a heavy incubus on the nation. But what is this to be compared with the Priests in Budd,ha's time. Why on the occasion* of his being "extinguished" or entering Nivan, there were no less than "seven hundred thousand Priests present." True, Buddhist Priests have not according to received Christian notions, the care of souls. But it is their duty to preach to the people, which at least is one of the methods taken by Christian Pastors to keep souls from straying. If Buddhist Priests in these days do not preach the doctrine in order to convert erring mankind, they depart from the great example set to them by Buddha, who, like Christ, preached frequently to the multitude, "who thereby obtained salvation."

Yours &c.

J. Low.

* Mahawanso Translation, p. 11.

TABLES OF TEMPERATURE AND RAIN AT BANGKOK.

The following Tables prepared by the Revd. J. Caswell an American Missionary in Siam, give Synoptical views of the Mean Temperature at Bankok, for each month of the eight years preceding January 1st. 1848; of the Extremes of Temperature for the same period; of the greatest and least, with the average, Daily Range of the Mercury for the years 1845-47 inclusive; also of the number of Rainy Days from 1840-44 inclusive; with the amount of rain in inches which fell each month in 1845-6-7.

Synoptical view of the Mean Temperature at Bangkok,—each month and year for the years 1840-47 *inclusive.*

	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	Average monthly means.
Jan.	77.16	78.77	79.32	77.53	74.59	74.07	77.18	74.72	76.67
Feb.	80.80	80.84	83.13	79.50	79.32	81.81	78.34	78.51	79.03
March.	83.58	85.73	83.73	83.71	85.79	82.36	83.35	82.02	83.78
April.	83.60	87.25	84.50	85.03	85.32	79.97	85.52	82.72	84.24
May.	84.08	84.67	83.41	84·75	84.58	82.04	83.88	81.82	83.67
June.	82.27	84.40	83.12	84.44	82.50	81.33	82.19	81.98	82.78
July.	82.66	84.39	81.92	82.51	81.28	79.89	81.41	82.20	81.99
Aug.	82.36	84.84	82.16	82.75	80.07	79.85	81.11	80.75	81.73
Sept.	82.83	83.48	82.02	82.01	80.15	79.73	80.37	80.20	81.35
Oct.	81.77	84.55	80.57	81.27	79.70	78.88	80.73	78.89	80.79
Nov.	81.15	82.58	78.92	80.83	77.52	76.84	77.16	79.02	80.50
Dec.	76.34	80.40	77.11	75.45	76.98	76.86	75.46	76.95	75.89
	81.55	83.49	81.66	81.65	80.65	79.47	80.56	79.98	81.14*

Extremes of Temperature for the eight years.

Jan. ..	61-89	65-90	66-88	64-89	62-90	54-88	62-88	60-89	
Feb. .	71-91	70-90	74-90	70-90	62-92	73-90	63-89	56-90	
March.	73-91	76 94	77-91	73-93	73-97	72-92	71-93	70-94	
April..	75-95	75-97	77-93	77-94	73-97	72-93	77-93	70-95	
May ..	75-93	78-91	78-93	76-96	73-97	75-94	76-94	75-94	
June..	76-91	78-93	77-91	77-95	75-90	74-91	76-91	74-90	
July...	76-91	80-91	77-90	77-90	75-90	73-90	75-90	75-89	
Aug...	76-91	79-93	76-90	77-91	74-88	73-91	76-89	72-90	
Sept...	75-93	78-89	75-92	75-92	71-88	74-90	75-88	74-88	
Oct...	71-91	77-93	71-90	71-90	71-89	70-89	75-90	72-87	
Nov...	68-89	75-90	70-90	70-90	64-86	68-86	65-86	72-88	
Dec...	65-87	70-90	61-88	61-88	63-88	64-88	66-84	67-85	
	61-95	65-97	61-93	61-96	62-97	54-94	62-94	56-95	54-97†

* Mean temperature for 8 years. † Extremes of temperature for 8 years.

Average Daily range of Mercury.				Greatest Daily range.			Least Daily. range.		
	1845.	1846.	1847.	1845	1846	1847	1845	1846	1847
January,.....	16.03	14.38	14.74	24°	22°	20°	10°	1°	11°
February,.....	12.64	12.64	15.25	16	20	21	3	5	8
March,.....	10.90	11.61	13.48	15	16	20	3	5	1
April,.....	10.60	10.50	13.66	15	14	18	4	7	8
May,.....	9.84	10.36	10.13	16	14	15	4	3	4
June,.....	8.13	9.13	10.10	15	12	14	4	5	6
July,.....	10.42	8.03	8.93	15	15	12	3	2	5
August,.....	9.58	8.06	8.64	16	12	12	4	4	4
September,.....	9.00	8.03	8.53	13	12	18	1	4	5
October,.....	8.94	7.80	7.61	16	12	11	2	2	5
November,.....	10.03	7.23	8.33	13	12	13	6	3	1
December,.....	12.55	10.80	10.10	16	15	14	7	6	6

Synopsis of Rainy Days.						Amount of Rain in inches, each month.		
	1840	1841	1842	1843	1844	1845.	1846.	1847.
January,.....	1	1	1	0	2	0.	.30	0.
February,.....	3	1	2	9	2	0	1.70	0.
March,.....	2	1	11	3	4	4.72	.50	0.
April,.....	9	5	10	5	8	9.32	.30	8.30
May,.....	18	19	20	10	18	9.84	2.55	8.54
June,.....	21	15	23	12	21	8.13	10.94	5.10
July,.....	16	14	12	18	20	5.03	6.20	6 12
August,.....	19	17	11	15	25	9.58	7.26	11.30
September,.....	14	12	18	21	21	18.66	13.84	12.00
October,.....	9	17	11	9	16	8.94	5.97	7.35
November,.....	8	11	4	2	12	2.20	3.01	5.16
December,.....	6	5	1	6	3	10	0	0
						76.52	52.60	64.17

Maxima and Minima of atmospherical temperature at Singapore.

June, 1848.

	Min.	Max.
1	73½	89
2	72	88
3	72	89
4	73	91
5	73	91
6	71½	91
7	75	92
8	75	87
9	78	90
10	75	86
11	73	89
12	73½	86
13	75	90½
14	75	90
15	75	93
16	75	90
17	75	91
18	75	92½
19	75	93
20	75	93
21	75	93½
22	75	95
23		
24	75	95
25	73½	90
26	74	93
27	74	84
28	75	90
29	75	93
30	76	92

Mean { Min. 74. 37. / Max. 90. 60.

J. R. L.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

A VISIT TO THE MOUNTAINEERS, DO DONGO, IN THE COUNTRY OF BIMA.*

By M. H. Zollinger.

The bay of Bímá is so well known that I need say nothing of it here. To the west and to the south east of this bay there run ranges of volcanic mountains, the summits of the highest of which rise to a height of 4 and 5 thousand feet above the level of the sea. The highest peak, rises even to 5500 English feet; it is the peak named in the country Arou Hássá. In the language of the country an isolated peak is called *Doro*, a mountain or a range of mountains, *Dongo*. It is from this that the inhabitants of the mountains are called *Dō* or *Do-on Dongo*, which is equivalent to the Malay words *Oráng Gunong*. However, in Bímá, the inhabitants of the mountains above mentioned are more specially designated under this name, they being particularly distinguished from the other inhabitants of the country by their religion and their singular manners. Although living very near to the bay of Bímá these people, known also under the name of *Oráng Dongo*, have never been visited by any of the Christians settled at Bímá. They tell very terrible or very ridiculous things concerning these poor mountaineers. First, they pretend that no European has ever been admitted into their village, and that if any one dared to enter, he would infallibly fall sick and die within a few days after. This comes, they say, from there being a great number of evil spirits in these mountains with whom the mountain-

* In the island of Sambáwá.

eers are closely connected, and whom they manage at their pleasure. All this only increased the desire which I had to explore the mountains and to make acquaintance with their inhabitants. The Sultan of Bímá gave his consent to this, and cheerfully lent his assistance. It was more difficult to find a Christian half caste of Bímá to accompany me and serve as an interpreter. I visited the mountains to the west of the bay, running from north to south, during the 7th. 8th. 9th. and 10th. September, 1847. What follows is a resumé of my own observations, and of the information I was able to gather, regarding the curious people who inhabit them.

It is not necessary for me to enter into details regarding the country itself. Like every country of the Indian Archipelago which occupies the sides of an old volcanic mountain, this country consists of a great number of trachytic ridges, which descend divergently to the bay of Bímá, and which are separated by ravines often very deep, of which the defiles are frequently almost perpendicular. In these ravines run streams very impetuous in the rainy season, while their beds are often dry in the good season.

The kámpongs are built on the very summits of ridges of mountains, sometimes however upon the easy sloping declivities, never in the vallies or directly upon the banks of rivers. This makes the access to these kámpongs very difficult, and they must be approached by paths cut zigzag along nearly perpendicular rocks. Some of these kámpongs are perched upon chasms 500 feet high like eagles' nests, for example *Embáwá*, and *Mánga*. They are well situated between 1500 and 2500 feet above the sea. As the houses in these kámpongs are very near each other, without having trees between them, and as they are covered with little rows of bambus of a grey colour, the kámpongs are seen from a great distance and present quite a different appearance from the kámpongs of the plain, which are almost always hid by a luxuriant vegetation of trees and bámbus. The villages of the mountaineers of Bímá resemble in this the villages in the mountains of Tengger in the Island of Jává, or, if we will, some villages in the vallies of Switzerland. A great inconvenience to the inhabitants of these villages in the mountains of Bímá is, that they must seek their drinking water at a great distance, that is to say, in the deep ravines which contain the rivers.

The houses of the Oráng Dongo are built in a very peculiar manner. Those who have ever seen amongst the Malays one of the small houses which are used as granaries for rice (paddie) can easily

figure these houses. They are entirely similar to them except that they are a little larger, and have a higher roof. The house rests upon 4 pillars of wood, 8, 10, 12 feet high, coming above the floor made of split bámbu. The roof rises almost immediately from the floor, the walls not being more than a foot in height. The roof is made sometimes of grass (álláng álláng *Mal.*) sometimes of rows of bambu (sirap *Mal.*) sometimes of the sheaths of pinang leaves (oupê *Mal.*) The interior of the house forms a single apartment, so that parents and children all live and sleep in the same chamber, which is not more than 12 to 15 feet in length and breadth, and which serves also for cooking. For all entrance, the house has in front an opening of the size of a window, which perhaps closes by a kind of shutter of the bark of a tree, and which is always without a lock. A ladder of bambu leads to this strange door; above in the house the men work, make cloths, keep their poultry, goats, their implements of agriculture, fire wood, bambus &c. For the rice they have granaries similar to the houses, only smaller. The utensils and household goods are easily named,—some pots, some baskets, some mats or goat skins to serve as mattrasses, a billet of squared wood to serve as a pillow; these are the whole. The mountaineers who have become Mahomedans are beginning to construct their houses like the inhabitants of the plain. The men of the Oráng Dongo dress like the men of Bímá. They wear very short trowsers of blue and white striped cotton; above it, a coarse sárong also blue and white. The rich only wear sometimes a short vest, the poor never have it. All have the hair long and smooth, confined by a band made of a Lontár leaf, and plaited in such a way that it sticks out side ways in the manner of a horn 4 to 6 inches in length. They have no other head dress. It is very remarkable that certain people of the South Sea Islands have a similar fashion of binding up the hair, for example at Otaheite. The men who have become Mahomedans wear upon the head a piece of cotton in the form of a kerchief, as do nearly all the Malay inhabitants of the islands of the Archipelago.

The women all wear very large trowsers which fall below the knees and which there clasp the leg. They are of very coarse cotton striped transversly in blue and white; above this they often (not always) wear a sarong of similar stuff. Like the men they are also dressed in a vest, which is very large and longer than that of the men, without sleeves but with the sleeve holes large. They

have no head dress and they bind up the hair like the women of the plain.

The mountaineers of Bímá are, as far as regards race, the same people as the inhabitants of Bímá itself; only they frequently have the skin more deeply coloured than the rest of the population. The women in general are of a frightful ugliness, and above all disfigured by a breast which has lost all its charms at a very early period. In this also the Oráng Dongo remind me of the inhabitants of the Tengger mountains. The language of the Oráng Dongo is the language of Bímá; they have certainly some other expressions which are not known in Bímá, but these are nearly all expressions for objects only known in the mountains, such as certain plants &c. The Oráng Dongo have no written characters, and it may be said that they have not the slightest trace of literature.

But let us return again to the exterior and domestic life of these people. Their arms are the poignard and lance; made almost exclusively in the villages of the plain. None are possessed of fire arms. It is forbidden to wear ornaments of gold or silver. They have only some rings and bracelets of copper and above all of brass. The food of these people is very nearly the same as that of the inhabitants of the low country. Rice and maise constitute the basis; they add salt, legumes (prepared in the shape of *sambal*,) poultry, dried meat (*dinding* in Mal:) dried fish &c,. But, what is a very great peculiarity, the Oráng Dongo eat every thing belonging to the animal kingdom, horses, pigs, monkeys, serpents, rats, bats &c., This is the reason why the Mahomedans of the country so heartily detest them, why they call them *Caffres*, why they regard them as people filthy and impure. The Oráng Dongo only drink water and *bruin*, an intoxicating liquor made of fermented rice. They make it very good (better than in the plain), and brown like beer. This arises from their slightly roasting the rice before fermenting it. They do not make palm wine, tuákh). Fortunately they are yet ignorant of the habit of smoking Opium. Amongst the Oráng Dongo, as throughout all Bímá, the people possess many buffaloes and horses. They plant rice, maise, tobacco, potatoes &c., The men are partial to the chace. In the mountains, they search for wax, rattans, and the fruit of the kamiri which grows abundantly there. There are travelling traders who live with the Oráng Dongo and purchase these articles from them, or barter them for cotton cloths, manufactures in iron and copper, such as knives, arms, ornaments &c.

The Oráng Dongo are not fond of descending into the plain, and if they do so they hasten to return as soon as their business is finished. They are not at all attached to the people of the plain, and these cheat and rob them in trade. That which still more frightens them, are the vexations and the extortions to which they are exposed on the part of their chiefs, both great and small. Formerly the father of the present Sultan forced them to give him a horse for a knife, a hatchet or a similar object. Even at present the chiefs make no scruple of demanding as a gift whatever takes their fancy at any time.

The mountaineers have also their feasts, such as those at births, at marriages and at deaths. I have not assisted at any of these domestic feasts. A young man who is about to be married pays a certain sum to the parents of the girl. This sum *(jujur* in Mal.) is not a fixed one, and varies according to the fortune of the parties. It is ordinarily paid *in naturalia*, for example, in buffaloes, horses, wax, cotton cloths &c. The newly married always commence house keeping in a new house.

The law relating to the right of heritage is very simple. All the survivors, sons and daughters, father or mother, brothers or sisters, inherit equal shares. But that which is more curious, and what I have never met with any where else, is that the defunct himself inherits from himself also, that is to say, he also has his part in the heritage! All that falls of the heritage to the deceased is divided into three parts. Whatever can be burned ought to be burned. What cannot be burned, such as arms and ornaments, is buried with the deceased. All that is living in the possession of the defunct ought to be killed for the purpose of being eaten by the survivors at the funeral entertainments which are not finished until all is consumed. To bury the dead they make a round and deep hole in the ground into which they put the corpse erect, giving him his arms, rings, bracelets &c., then they put a brass basin (bokor in Malay) on the head, and close the tomb with a flagstone. I have seen many of these stones shutting tombs. In the mountains to the south east of Bímá the interment is still more extraordinary. They cut a trunk of a lonthar tree of the length of a man, then split the trunk and hollow out the two halves. In one of these two halves they lay the dead body, and place the other upon it. This coffin is placed upright some place out side the village. Leaves of the lonthar are put upon it which serve as an umbrella (páyong in Malay.) When the

death feast commences they kill a buffalo, throw it down outside the kampong, make a fence round it, and leave the dead animal thus until the feast is about to be finished, when, as a conclusion, the assistants devour the buffalo even although it is completely putrified. It remains for me to say a few words upon the religion of these people, if religion there is amongst them.

From all that I have observed and learned the Oráng Dongo know nothing of God, of a superior being, creator and preserver of the world. They are not even acquainted with spirits good or bad, intermediatory between men and the genius, good and bad, of the world. Their ideas on this head are so thoroughly steeped in materialism that they attribute all supernatural or incomprehensible force to real objects, such as, for example, to the sun, the moon, the sea, trees, volcanos, and above all to stones. This perhaps arises from the circumstance that the whole of their country is nothing more than a mass of stones and rocks. The Oráng Dongo are then true partisans of fetichism, as were probably all the inhabitants of the Indian Archipelago in times more or less remote.* It is above all in the stones that they seem to have most confidence. In case of accident, or disease they address themselves to stones, they carry offerings to certain amongst them, all this to implore the favor and assistance of their genius, named *Déwá* by the Oráng Dongo. There is still more. In front of each house there are some large stones, flat and very smooth, which serve for tutelary stones to the inhabitants and at the same time as places where they do their needs! each time the stone has served the last purpose, it is carefully cleaned!

The Oráng Dongo have one great feast annually. It is called *Roujá*, and commences the first new moon after the rice season. Some days previously they collect all the dogs and tie them up to make them very hungry. The first day of the feast being come, every one quits the villages, not a single person remaining, all go to the mountains where they amuse themselves with the chace and doing nothing, singing and shouting. They must not avail themselves of fire arms; this would bring ill luck to the hunt. Every thing living, deer, wild pigs, monkeys, birds, serpents &c. is devoured! The women occupy themselves in the meantime in cooking and twisting threads of cotton bought in the plain and which are the ends of threads which each piece of cloth has at its extremities.

* See ante vol. I. p. 282

When these ends of threads are twisted, the Oráng Dongo make them anew into cloths of which they cut out their coarse clothes. It is asserted in Bímá that the assistants in the feast go entirely naked during its continuance. I do not believe this. No other person has ever assisted at this feast. The people of the plains dare not go during this time into the villages of the mountains, for it is then that the evil spirits (Seihtán gunong) are most active, most malicious, and most to be feared. After three days of feasting they return to the village; on the morning after their return all repair to the sea side into which they throw the remains of the provisions of the mountains. This is probably a kind of offering. When they go to the sea they put on their best clothes and ornaments, they then dance to music or clapping of hands, eat and drink, and in the evening return to the mountains, after which the feast is at an end. When I travelled in the country of Dongo it was a few days before the *Roujá*. They were already making preparations for the feast, and I had the pleasure of hearing the furious yelling of the bound and famished dogs. It ought to be added, that before quitting the village at the commencement of the feast, they lead a black dog round the kámpong, every one whipping it. This dog is called *Rouja* and it is from it, they say, that the feast takes its name. It is not at all astonishing that such people should be superstitious. Every thing with them is matter for superstition. They dare not for example burn in their houses oil lamps, or tallow candles; this would cause a bad rice season. They only burn in the houses wax candles, or flambeaus of wood or bambu. They looked upon me every where as a Déwá, simply because on one of the ridges which I had climbed I caught a young hind living, and because the resinous juice of the *Semecarpus Anacardium* did not injure on touching my skin. After all, the Oráng Dongo are a very peaceable people, submissive, laborious and timid to a very great degree. Theft, assasination and adultery are almost unknown amongst them. Polygamy is permitted, but very little practised. For some time past, Hádjís and fanatic Arabs have endeavoured to convert the Oráng Dongo to Mahomedanism. They have not had much success. They do not adopt a very attractive method. They traverse the villages of the mountaineers, rod in hand, and crying " dogs, do you wish to pray or not"! The converts, for there are some, remain as they were before, except that they wear a morsel of cotton handkerchief upon the head, do not eat pork any more but in secret, and construct their houses

like the people of the plain. They call their stones "Nábí Máhomed"* or else Déwá, but they put their confidence in them as they have always done. The mountaineers, who have become Mahomedans go to be married in the mosques of the villages in the plain, and they ought also to assist in the ceremonies required by the Mahomedan religion. As to the political circumstances of the Oráng Dongo I have nothing to say. They are subjects of the Sultan of Bímá, like the other inhabitants of the country, governed in the same way, under the same laws and under the same servitude, the only difference being that they are more burdened than the others.

H. ZOLLINGER.

* See vol. I. p. 338* and note.

SPECIMENS OF THE DIALECTS OF TIMOR AND OF THE CHAIN OF ISLANDS EXTENDING THENCE TO NEW GUINEA.

By Geo. Windsor Earl, Esq., M.R.A.S.

In the south eastern parts of the Indian Archipelago, where opportunities of social intercourse between the various petty tribes are of rare occurrence, every island, indeed every detached group of villages, has its own peculiar dialect, which is often unintelligible even to the tribes in its immediate neighbourhood. In some of the larger islands, Timor, for example, these tribes are so numerous, and the country occupied by many of them is so little known, that it becomes impossible to form even an approximative estimateof their number. As far as I have had opportunities of judging, however, the dialects spoken by these tribes differ more in appearance than in reality, and those at least of the brown-complexioned or Polynesian races seem to be mere subdivisions of one common language. I have given below a comparative vocabulary of the dialects spoken at different spots between the south end of Timor and New Guinea, one for each group, which will afford some idea of the affinities which exist. These, with the comparative vocabulary of the dialects of Saparua, Ceram, &c. in Sir Stamford Raffles' History of Java, will furnish one specimen at least for every group in the Timor and Banda seas, with the exception of Sumba or Sandalwood Island, and although not containing many words, they will probably be found sufficient for all common purposes of comparison.

The more extended vocabulary given below is that of one of the dialects of the island Kissa, near the east end of Timor, one of the Serwatty group. It is spoken by more than two thirds of a population estimated to amount to 8,000, probably as large a number as will be found any where in these seas speaking one particular dialect, and as there is no evidence of the inhabitants having mixed in the slightest degree with the Papuans, it is well adapted to furnish a specimen of this eastern group of dialects. Having visited the island on several occasions, I had repeated opportunities of revising the vocabulary, which became the more necessary from the circumstance of individuals differing somewhat in the pronunciation of certain words, especially of those which contained gutturals.

On my first arrival at Kissa, I was very much struck by the peculiar harshness of the language, owing to the immense number of gutturals it contained, coupled with the total absence of the nasal "*n̂o*", (so common in the western dialects of the Archipelago, at well as in those of the Australians and Papuans), and with the almoss total absence of sibilants. I was thence induced to suppose that the language of these groups would prove an entirely new one, but upon examination I found that at least one sixth of the words contained in the vocabulary corresponded with the Malayan, but were so disguised by the substitution of one consonant for another, that the affinity, in many instances, could not be recognised without difficulty. For example, in the words common to both languages the "t" of the Malayan is represented by a guttural "k"; "s" by a guttural "h"; and "b" by "w". The follow examples will give an idea of the effect of such transposition:

English.	*Malayan.*	*Kissa.*	*English.*	*Malayan.*	*Kissa.*
Stone	batu	wahku.	Hog	babi	wawi.
Sea	tasé	kahé.	Feather	bulu	wulu.
Eye	mata	makan.	Hot	panas	manah.
Dead	mati	maki.	Wrong	sala	hala.
Heart	ati	akin.	Hard	kras	kereh.
Heavy	brat	werek	Milk	susu	huhu.
Broken	patah	pahki.	Wash	baso	baha.
Ear	telinga	kilin.	New	bharu	wohru.
East	timur	kimur.			

With regard to the structure of the language I cannot say much. To decide upon this point it is necessary to be perfectly familiar with the language, and where it has not a written character, this familiarity can only be acquired by long residence among the people who speak it. I have therefore contented myself with giving a few sentences at the end of the vocabulary, and even these are not to be entirely depended upon, for as it became necessary for me to obtain them through the medium of the Malayan language, my informants may have adopted the idiom of that language in giving me the sentences that I required. I feel confident, however, that its composition will not be found to differ greatly from the Malayan, or rather from the Bugis, (to which, of all the written languages of the Archipelago it appears to bear the greatest affinity) and also that it will prove more simple and defective than either. It struck me as

being quite unfitted for the explanation of abstract ideas, and no greater proof of its meagreness is required than the fact that one single term is employed to indicate circumstances that have only an indirect affinity. For instance, " old" and " poor" are expressed by the same word, " naikléher."

The system of orthography for dialects that possess no written character has now become so well established, that it is scarcely necessary to give the power of the different vowels : *a* is pronounced as in father ; *e* as in ever, *é* (with an accent) as the *ey* in they ; *i* as in ravine, and *u* is invariably to be pronounced in the continental manner, like the *ou* in soup. The comma between two vowels as in " koka'al" indicates a slight guttural which no letter in our alphabet is calculated to express. The accent is always on the penultimate, unless the contrary is indicated.

A, an	ita, ida.	Bathe	naroho.
Abide	namomoli.	Bay	holok.
Accept	koka'al.	Be	aile.
Accompany	leunohi.	Beard	wehin wulu.
Aged	naik leher.	Beat	nerehév.
Agreeable	namini.	Beautiful	maruru.
All	na'akemi.	Become	nambali.
Alive	mori-mori.	Bee	wanyi.
Alligator	lawoör.	Beg	napanak.
Anger	nahan.	Belly	konoin.
Ant	keirsi.	Bent	napaléhu.
Areca nut	poör.	Better	wahanrehi.
Arm	liman.	Bind	na'akéri.
Ashamed	nawawa.	Bird	manu.
Ashes	apu.	Bite	nihi.
Ask	maukani.	Black	mékin.
Assist	pahkur.	Blind	makantók.
		Blood	ra'arn.
Back	ko'örn.	Blow (to)	mowa.
Bad	ailandi.	Blue	makomak.
Bald	ulu-por.	Board (plank)	awahan.
Bamboo	oho.	Body	kemen.
Bargain	tawar.	Boil (to)	na'ali.
Bark (as a dog)	ahu kour.	Bold	nahuhuru.
Basket	ipun.	Bone	ruhurni.

Box (a)	opalahat.	Cry (to)	kaisi.
Bread-fruit	uru.	Current	hari.
Break	paha.	Cut (to)	ta'ari.
Breast	irohan.		
Broad	napalowo	Darkness	naumetik.
Broken	pahki.	Daughter	upian-mavek.
Brother	mólwali-anulu.	Day	lerit.
Buffalo	arpau.	Dead	maki.
Buy	weli.	Deaf	rohon.
		Descend (to)	kopur.
Calm	namilína.	Dew	warenwuhi.
Call (to)	mapulu.	Die (to)	maki.
Canoe	o'omakan.	Difficult	heheli.
Cape	loron.	Dig (to)	nahiri.
Carry	mawari.	Distant	kohu.
Cat	pusi.	Dive	helemi.
Catch	keli.	Dog	ahua.
Centipede	sahiörni.	Door	nika.
Change	herì.	Dream (to)	namarimi.
Charcoal	aren.	Dress (clothes)	nai nairi.
Cheek	muman.	Drink (to)	nomon.
Chew (to)	na'an.	Drown	keperi.
Child	ria-tatahan.	Drunk	nahak.
Chin	wéhin.	Dry	naporok.
Chizel	wakeki.	Dumb	akukur.
Clay	enimo-memeri.	Dust	moöl
Clean	moumou.	Dwarf (a)	ria-teteul.
Cleave, cloven	nadiweki.		
Clever	nàhursì.	Each	ma'ahaku.
Cloth	tapi.	Ear	kilin.
Cloud	kakan.	Earth	enimo, noha.
Cloves	jenki.	Earthquake	ruru-ai.
Coco-nut	nohori.	East	kimur.
Cold	rin.	Eat	na'an, yohon.
Come	mai.	Egg (birds)	manu-keër.
Copper	pirah.	Elbow	liman-ihun.
Cover	atawé.	Empty	moumou.
Cough	hoaro.	Enter	lararan.
Count	akié.	Entrails	konoin-rarama.
Crooked	napiléo.	Eye	makan

Eye-brow makan-wulu.
Eye-lid makan-ihorn.

Face oïn-makan.
Fall (to) pupur.
False haäla.
Fat poir.
Father bapa.
Father (step) bapa turan.
Fear namakauku.
Feathers wulu.
Fever nakanhir.
Few tapuran.
Fight (to) na'aisni.
Fill, full, penoh.
Find lernahli.
Finger limán-rahan.
Finished oroidmer.
Fire ai.
Fish ihan.
Flame rob, léhr.
Flesh maheine.
Fly (a) lahri.
Foot éhin.
Forehead leren.
Forgotten renhamlin.
Fowl manu.
Fruit woïni.
Fry (to) noöri.
Flue au-ai.
Full penoh.

Garden apaké.
Give ya'ali,
Glad raämnodi.
Go mala.
Goat jatuawi.
Gold mahé.
Good wahan.
Grand-father opai.
Great laláhap.
Grow mohri.
Guava mahami.

Hair of the (head) murukon.
Hand liman.
„ (right) liman-owahan.
„ (left) liman-iyak-iyak.
Hard kereh.
Hatchet héhi.
He, She inyi.
Head ulu-wahku.
Hear terna.
Heart akin.
Heat manah.
Heavy werek.
Help (to) pahkur.
High kuhlu.
Hill wohor-aän.
Hire (to) naiveheli.
His, hers ainina.
Hog wawi.
„ (wild) wawi-merui,
Hot manah.
House romé.
Hung, hang wauri.
Hungry namalara.
Husband mohoni.

I yahu.
Island nohan.
Iron wonokon.
It inyi.

Jack-fruit (nangka) uru-malai.
Joy raämnodi.
Jump néhi.

Keen namalorna.
Keep (to) pahkuéti.

Kiss masir.
Knee éhin-koōrn.
Knife kuri.
Know (to) iäweroin.

Lame tehku.
Large laláhap.
Laugh nalau.
Leaf au-kawi.
Leg èhin.
Lie down heriali.
Light (of day) léhr.
Light (weight) naparan.
Lighting litar-litar-maki.
Lip nibikan.
Live (to) mo'ori.
Living mori-mori.
Long naharu.
Look (to) tollé.
Lose (to) renhamlin.

Mad seri seri.
Maize kaliéku.
Make (to) ihir.
Man (a) mohoni, ria.
Mankind ria.
Mango mampilan.
Many lapiak.
Mat pikir.
Melon (water) sépu.
Middle tohoro.
Milk huhu.
Millet nékémi.
Mouth wollilit.
Moon wolli.
More ikar.
Mother ina.
„ (step) ina-turan.
Mountain wohor.
Mount (to) haher.

Much lapiak.
Mouth nuran.
Mulberry (paper) werau.
My, mine ainuhu.

Nail (finger) liman-makan.
„ (iron) rohé.
Name onaram.
Near nahurani.
Neck kelan.
Nephew molwa'i-anam.
Niece yaōnaro-anan.
New wohru-wohru.
Night alam.
North rahé.
No ka'ali.
Nose iruni.

Old naikléher.
Open hariyi.
Orange sapu.
Other enen.
Owe (to) ohkon.
Our iki-niki.

Papaya mumalai.
Parrot lakumuti.
Past selia.
Pay (to) kauni.
Pearl mutiara.
Pea laururu.
Perish iaka.
Pigeon merpati.
Pillow luni.
Plaintain muhu.
Plantation apaké.
Plate (a) pian.
Please (to) râamnodi.
Poor naikléher.
Potatoe (sweet) hami.

Pound (to) kukun.
Pull (to) hélé.
Putrid poöp.

Rain ohkon.
Ready napakeki.
Recollect mahinorki.
Red memeri.
Repair wahani.
Request napanak.
Respect hiheni.
Return waliali.
Rib rusan.
Rice alueri-ihir.
,, (boiled) haha.
Rich léhernala.
Right nameloho.
Ripe awara.
Rise namaka.
River oira-lapi.
Rob nahori.
Round pupuhan.
Run lari.

Sago (prepared) lehular.
,, (tree) pihir.
Sand totlé.
Same nohiwuk.
Say (to) a'ahevi.
Scrape worni.
Scratch haruka.
Sea kahé.
See (to) tollé.
Sell naolo.
Send iopeni.
Shake nararuru..
Sharp namalorna.
Share ha'ari.
Sheep pipi.
Short téul, tetéul.
Shoulder kawahal.
Shove mohkuli.
Sick apina.
Silent kerkaram.
Silly kana-woroin.
Sing nahinari.
Sister yaönaro.
Sit naikoro.
Skin hùlikin.
Sky a'am.
Slave ahka.
Sleep namkuru.
Slow kerkermit.
Small teta'an.
Smoke ai-maho
Smooth uikana.
Sop mamal.
Son upian-mohoni.
Some taperan.
Sorry hehéli.
South karan.
Sparks ai-léhr
Speak wahkunu.
Spear keiri.
Spoon hurua.
Stab (to) katir.
Stammer (to) ahak.
Stand (to) mamiriri.
Star kaleör.
Steady kerkaram.
Steal namanaha.
Stone wahku.
Stool awahan.
Storm ané-laláhap.
Straight namlélòrlet.
Strong naruri
Such iheheni.
Sugar-cane kéhu.
Sun, léri, léhri.
Sun-rise lehr-inha.

Sun-set lehr-inhelim.
Swamp taäl.
Sweep sapu.
Sweet namina.
Swim nani.
Sword rahai.

Take kokáal.
Tall kulu.
Tamarind au-muli.
Tame ormenor.
Tell maukani.
Teeth nihan.
That enen.
Thatch kanari.
They éëneni.
Theirs hirira.
Thick namawal
This enieni.
Thigh ehin-lapan.
Thin namanisa.
Think ainork.
Thirsty maroho.
Thou oho.
Thread awahi.
Thy, thine unu-uma.
Thumb liman-lapan.
Thunder nohan-nuhur.
Timid namkaku.
Tin kimiru.
Tongue naman
Tortoise-shell keirni.
Touch tukulu.
Tree au-hon.
Turn napailili.
Turtle ennua.

Valley kau.
Very idmé.
Village lehké.

Uncover hariya.
Understand a'avroin.

Waist heran.
Wait lapani.
Walk malaha.
Warm manah
Wash baha.
Water oira.
„ (salt) oira kahé.
Wax lilli.
We ika.
Weary maha.
Weep naheri.
Weigh kaili.
Well (of water) oira-makan.
West warak,
Wet pauku.
What inha'av.
Which é'evi.
Whirlwind turuhé.
White waraha.
Who inhohi.
Wicked ailandi.
Wife hohon.
Wind ané.
Window awoli.
Woman ria-mavek.
Wood au.
World noha.
Wrong hala.
Wound no'er.

Yam uwi.
Year aninit.
Yellow ma'ara.
Yes wahan.
Yesterday öiravi.
Yet makun.
You oho.

Numerals.

1	ita, ida.	20	weroh.
2	woror.	21	weroh-ita.
3	wokél.	30	welikel.
4	wo-ahka.	40	weli-ahka.
5	walima·	50	weli-lima.
6	wanam.	60	weli-nam.
7	wo-iko.	70	weli-iko.
8	wo-ah.	80	weli-ha.
9	wo-hi.	90	weli-hi.
10	ita-weli.	100	rahoita.
11	ita-weli-ita.	1,000	riun-ita.
12	ita-weli-woror,		

A dog.	Ahua ita.
The fish is still alive	Iya moöri-moöri makun.
He is very old	Inyi naikleher idmé.
This is very bad, but the other is worse.	Enien ailandi wahké, enen jaka wahké.
The river is as broad as this ship.	Oira-lapi napa-lowo nahöi kapal enieni.
Buffaloes are scarce in that country.	Arpau kanlap nohé enen.
He has been dead a long time.	Maki nalahol idmé.
Come here.	Mai ieni.
A strong wind is coming.	Aué lalàhapi mai-mé.
The wells are dry and we have no water.	Oira makan naparok, oira ka'a-li.
Do you understand what I say to you?	Ohom a'avroin yahu a'ahevi o-ho?
Is the fruit ripe or not?	Wöin awara mehé kaun?
What is your name?	Onaram inhohi?
Every body knows.	Ria na'akemi iaweroin.
I am hungry, give me something to eat.	Yahu namalara mala ahida yo-hon.
Come and assist me.	Mai pahkur yahu.

English.	Island of Rotti (near S. W. end of Timor.)	Coepang. (S.W. extreme of Timor.)	Vialo. (N.E. extreme of Timor.)	Kissa.	Tenimber. (Baba.)	Kéh Islands. (Kéh Doulan)	Arru Islands. (Wokan.)
1	ésa	mesi	okani	ita	ita	sa	itu
2	dua	nua	èyé	woror	borè	ru	rua
3	telu	tena	utué	wokel	watel	antel	lasi
4	a'a	a'a	vatè	wo-ahka	wiiti	an-far	ka
5	lima	ni	limi	walima	walima	an-lim	lima
6	nè	né	nemi	wa-nam	wa-lem	an-nan	dubu
7	hitu	hiit	fitu	wo-iko	wa-ité	an-fit	dubem
8	falu	fa'an	kafar	wo-ah	wa-am	an-wau	karua
9	siu	seu	siwa	wo-hi	wa-siawa	an-siu	teri
10	sangahulu	bo-es	taána	ita-weli	alult	wut	ufafahia
11	sangahulu-ésa	bo-esa-mesi.	taana réeni okani	ita-weli-ita	alult-ita	wuten meche	..
20	dua hulu	bo-nua	taana etjé	weroh	we-rior-	put-ru	..
30	..	..	taan utué	welikel	we-lekeli	put-el	..
100	natu ésa	natu-mesi	rahé	raho-ita	aida	ratu	..
1,000	..	..	..	riun-ita	riwen-ita	riwun	..
Earth	nusu	paha	moha	noha	noha	noho	fafa
Water	oi	oir	ira	oira	iera	wair	waya
Sun	léroh	nenoh	watju	leri	leher	leher	larat
Moon	fulan	funa	uru	wolli	volle	huan	fulan
Star	dung	fuhun	..	kaleor	tiola	nahr	tawar
Man	hata-holi	hatoni	maharu	mohoni	amenmeni	bun-ran	lesi
Woman	ina	bifé	tupuru	mavek	wata	wat-waat	kodar
Head	..	..	chao	ulu-wahku	otone	uhn	fuku
Hair	..	..	chao walé	murukon	murutne	morun	kuku
Hand	..	..	tangan	liman	liman	liman	lima
Foot	..	..	kaki	ehin	logami	ehan	ebahi
Eyes	..	..	mata	makan	makne	matan	mata
Nose	..	..	irun	iruni	irinne	mirun	juri
Mouth	..	..	oho	nuran	norinne	ngoen	fafahi
Ears	..	..	walt	kilin	telinné	arun	taharı
Hog	fafi	fafi	pahi	wawi	wawi	uava	fafu
Dog	busa	asu	iparu	ahua	ahia	yahao	foh
Fowl	..	..	atsar	manu	iwir	manut	tor
Bird	..	..	olo	manu	mani	manur	manu
Goat	bibi	bibi	pipi	jatuawi	bibi	bib	..
Tree	au	ahu	eté	au-hon	aia	utin	..
Fire	ha'i	ai	atar	ai	..	..	..

REPORT ON THE ISLAND OF BANKA.

By Thomas Horsfield, Esq. M.D.

MINERALOGICAL DESCRIPTION OF THE ISLAND.

(Continued from p. 427.)

I have now to relate the remarks I made in the tract which extends from the bottom of the Bay of Klábbet to the eastern shores of the island. I pursued my route up the river of Láyáng, one of the largest rivers not only of this part, but of the island generally. Its course is, on the whole, from west-north-west to east-south-east. It pervades, for a considerable distance the southern part of the alluvial district, and it approaches, in some of its curves, the northern promontories of the Gunung Máráss. Its banks are covered with luxuriant vegetation and it receives numerous smaller rivulets. Near the old settlement of Pángkál-puti I perceived large rocks projecting beyond the water, but the superstition of the natives prevented an examination: the principal branch now takes a direction nearly north, while a smaller continues towards the east, this leads to Láyáng. Beyond the division the country in many places is clear and the banks are ocaasionally exposed: their colour is whitish and they consist of pure white sand mixed with clay.

On landing at Láyáng and ascending a gently inclining eminence which leads to the stockade, I remarked, dispersed on the ground, the usual substances that are found at the mines; on enquiry, however, I was surprized to hear that no mine had been worked on that spot. This directed me to examine this hill and several vallies in the neighbourhood with more attention. I found in various places fragments of pure quarts and felspar on the surface or very superficially covered with soil, they were bedded in the usual mixture of sand and clay which forms the strata of the mines. This mixture also covered separately extensive plains, and alternated with spots of pure sand. The fragments of quartz and felspar were in many instances of considerable size. Where the hill was exposed by vertical sections made by art, these substances were more distinctly observed in their natural situation.

Near the banks of the river I observed large detached fragments of Red-Iron-stone and of Sand-stone. The clay had often a reddish colour.

In a valley in a different direction from the stockade, which transmits a small branch discharging itself into the large river, these appearances were still more evident and instructive. The descent about 30 feet, is very steep: at the bottom, near the banks of the rivulet, I found an extensive vein of Red-Iron-stone. Its surface is very uneven and covered with excavation and cellulosities by the occasional operation of the water to which it is exposed. The adhesion of its particles is not strong; it is spungy and absorbs the water, but acquires more consistence by drying. The fracture resembles that of an earthy mass; if force is applied the rock breaks into irregular fragments, and presents a variegated substance, cellulous or spongy, consisting of particles of an ochreous nature and colour from dark brown to yellow. Black spots possessing nearly a metallic lustre are likewise perceptible.

A peculiarity of this Red-Iron-stone is its being very copiously interspersed with minute particles very lustrous, somewhat resembling mica, but exhibiting an appearance more truly metallic, as small foliæ or squares.

The side of the hill on this descent presents the strata of which it is composed very distinctly. I noticed the following:

1. Soil.
2. Sand mixed with fragments of coarse quartz.
3. Clay with large fragment of quartz and felspar, resembling those that are found at the aqueducts of the mines. The most careful comparison with those that were taken up at the mines of both peninsulas above described, several months after they were collected, shows no difference in their nature or appearance.

The siliceous portions are pure quartz, or a variegated mixture of quartz and felspar, their fracture and mode of separation agrees with that of the objects already described; some fragments consist of minute particles of quartz regularly crystallized bedded in felspar which is decomposed and appears as a white powder. The separated particles of the pure felspar are rhombs, prisms &c.

Those layers in which the clay was more abundant, both in this valley and on the ascent of the hill above mentioned, equally agree with those observed at the mines; the clay is mostly of a white colour, and contains minute siliceous particles of the nature of the larger ones.

The compact Red-Iron-stone was found in detached fragments not only near the banks of the river, as mentioned above, but in va-

rious other situations about the stockade of Láyáng: The fracture of some of these resembled those of Jebus, others consisted of concentric bands, and were more compact and ponderous.

The appearances exhibi ed by this valley and by the whole neighbourhood were very interesting, they shewed plainer than I had yet remarked the conjunction of the Red-Iron-stone with substances derived from decomposed rocks of the primitive portions of the Island; but the conclusions will be made in another place.

In proceeding from Láyáng on a course varying east, and east-north-east, the tract is low and many parts are occasionally overflowed: these require, to admit passage, some assistance, which is afforded, as in other parts of the island, by means of bridges constructed by the natives of long slender poles placed near each other and united by rattans. The country is covered with woods and the soil is black and deep. A short distance beyond Láyáng I noticed detached fragments of Red-Iron-stone; these were followed at intervals of various distances by extensive fixed veins of the same kind of stone, alternating again with tracts on which all the fragments were loose, and rounded on the surface like those of the purely alluvial districts. The hill Gunong Pantjá is observed north, a little east from the road. The country continues low and marshy, the road crosses various rivulets flowing into the large river of Láyáng; this I also passed near its source.

Pure white sand is occasionally observed, and the country gradually rises as one approaches the vicinity of the mines of *Káttá;* large fragments of siliceous stones (resembling those of Láyáng &c.) are now found on the surface, alternating with loose fragments or fixed veins of Red-Iron-stone, and this succession continues to the neighbourhood of Lámpur. Beyond the districts of Káttá the forests have mostly been destroyed, the country is open and the hills are plainly observed: there is, indeed, a constant alternation of vallies and elevations, producing a waving surface, similar to that between Jebus and the district of the Lower-furnace.

The mountain of Bettung is observed in the east, the hill Sámbong-Gero nearly south-east, and the mountain Márass occasionally in the west.

Having arrived in sight of the village and furnace of Lámpur, I observed a steep hill, about half a mile north of the road, partly covered with verdure. On examination it was found to consist of a pile of large rocks rising on the whole perpendicularly above 50 feet.

The sides were externally in most cases flat or tabular, but the surface was grooved or pitted. Those fragments which were separate from the common pile had generally on oblique disposition. The general colour of the rocks externally was grey, but they were variegated with narrow streaks or lines, formed by a substance different from the common rock, and often crossing each other in a manner similar to those above described found in the river of Kámpák; at these lines they separated into rhomboidal and pyramidal fragments, of great variety. The colour of the fracture was light blue or white, and lines of a different colour were observed on it as on the surface.

The substance of the rocks was purely siliceous and exhibited not the least sensibility on the application of the strong acids. Fragments of the same kind of stone were brought to me by the natives from the declivities of the mountain Penyábong, possessing the same colour, fracture, disposition to separate &c., the similarity, in one respect, of the rocks in the river of Kámpák has already been mentioned, and similar rocks were afterwards found in the environs of Minto. This rock deserves some notice in the mineralogy of Bánká, its nature approaches to that of Hornblende; but I shall not, at present, give it specific name: is probably belo gs to the class of *Primitive trap* of Werner. Its fracture considerably resembles that of Basalt.

This pile is placed in some degree intermediate between the secondary district (or that consisting of Red-Iron-stone and of various strata) and the primitive ridges which traverse the eastern boundadary of the peninsula. From the mouth of the river of Láyáng to the mines of Káttá the country is but little raised above the level of the ocean. Near the mines of Káttá and further eastward the country gradually rises: it is connected with the district containing the mines of Mápur and Dsheniáng above mentioned, stretching thence in a southern direction to the extremity of the island. This tract comprises the mines of Sungie-liát, Máráwáng and Pángkál-pináng.

Although the same substances found in the parts of the island already described constantly occur again, there are peculiarities in the arrangement of the strata, and in the component parts, of which I shall endeavour to give an account in the continuation of the mineralogical details.

The chief mines of the district of Sungie-liát, (besides those of Káttá and Dsheniáng already mentioned) are those of Lampur, Ayer Durín, Robo and Robo-klí: the former two are situated westward,

the latter eastward of the hill Bettung. In one of the small mines of Lámpur I remarked the layer of Tin-ore, more superficial than I had hitherto been accustomed to: under a thin covering of soil of about six inches the miners shewed me the stratum and produced a small quantity of ore by the usual process of washing. The whole depth of the stratum was from 6 to 5 feet. In the upper part, which contained a considerable admixture of clay it was very thinly disseminated; the lower portion, consisting chiefly of minute particles of a siliceous nature, contained larger proportions of the ore. The particles which compose this stratum are almost uniformly minute and it required considerable search to collect some explanatory specimens of a moderate size. Besides the usual fragments of decomposed primitive rocks, I found some of a kind which appeared peculiar to this tract. It had externally an irregular form, somewhat botryoidal or deeply corroded, the angles all rounded and shewing strongly the effects of a current of water. The fracture exhibited a stone of the nature of Hornblende, of different shades of colour. Some of the fragments had a reddish hue, others were intersected by lines in a manner similar to the large pile of rocks abovementioned. In different parts of the environs of the mines of Lámpur, flint is occasionally found, small pieces were given me by the miners, and large fragments have occasionally been carried away by the former Kongsies, but I was not fortunate enough to find it in its natural situation. The fragments I procured had the usual yellowish grey colour: the stone appears to exist here only in small quantity. Several of the botryoidal fragments abovementioned considerably approached to the nature of it in their fracture.

Proceeding from the mines of Lámpur the road gradually approaches the northern extremity of the mountain of Bettung: the tract is nearly level, and extensive surfaces are in some places covered with a deep layer of sand. I noticed comparatively few loose Red-Iron-stones, and none in fixed rocks. About 2 miles to the west of Sungie-liát large granite rocks project form the surface, they are here thinly dispersed, on approaching the mountain the number increases, and when it comes distinctly into sight numerous large rocks are perceived on the declivities.

The first mine which I examined in the environs of Sungie-liát was that of *Woongin*; it is one of the few large mines of this district and has lately been opened. The workmen were employed on a pit which was, at this time, 10 feet deep, the strata under the soil

consisted of alternate bands of sand of different colours: there was something singular in the appearance of these strata, which exhibited strikingly the agitation of water at the period of stratification. No Breccias were observed in the environs, nor had any remained at the aqueducts after the washing of the ore.

The contents of the last stratum of the pit lately worked were still accumulated and afforded me an opportunity of examining the substances separately and of collecting explanatory specimens. There was a striking peculiarity in every thing found at this mine; the operation of a powerful cause which is evident in the arrangement of the superior strata shews itself here in the effect produced on the separate fragments composing the last layer which contains the ore of tin. These substances are almost purely siliceous, composed of quartz, felspar, mica and schorl: among which are found occasionally masses of clay, but they appear to have been subjected to a power, which in many cases has completely dissolved their union or the adhesion of their particles: most of them are so loose in their texture that they cannot be handled, but separate and crumble to pieces when one endeavours to take them up; others still retain some adhesion, but the fracture shews a greater readiness to separation then is generally observed in the stones remaining at the aqueducts. In a few the external surface has remained partially entire, these are completely rounded by attrition. The regularly striated surface which appears on some of the fragments is highly characteristic of their original constitution, the particles of quartz have remained and shew themselves on the striæ while the felspar separates as a white powder. In some fragments the crystallization of the particles of quartz is very regular and these approach the nature of rock-crystal: others again consist of minute slender crystals, which break when the least force is applied, presenting a fracture covered with numerous needle-shaped points; many of the fragments possessing more solidity, have rounded angles, and their surface marked with numerous intersecting lines shews them to belong to those siliceous rocks which have already been noticed as occurring in extensive veins in different parts of the island.

The white friable substance, found at the termination of the stratum, was copiously dispersed through the heap, and to this the particles of tin-ore mostly adhered.

The situation of this mine is about two miles from the eastern shore of the island and one from the northern extremity of the

mountain Bettung in a direction almost south of the mine-district of Dsheniáng.

A small mine is worked within a mile of the one just described. The ore is here found nearer the surface; the layers consist of sand and coarse siliceous fragments; a white friable clay is peculiarly abundant in this mine.

The strata containing the ore have been very abundant at Sungieliát. In an east-south-east direction from the stockade I passed a tract of several miles in which alternate spots occurred from which the ore had been extracted chiefly by small works. Many of the aqeuducts of the old mines were still discernable. Among the remaining stones I found rock-crystal in great abundance, some had remained perfectly transparent others had the surface clouded by attrition and the angles rounded: a kind of impure crystal also occurred nearly opaque with the sides regularly transversely veined. The stones found at Wunhin already indicated the vicinity of an extensive tract containing rock-crystal and numerous specimens were formerly collected here by the miners. A little east on the road, I met a large vein of a siliceous rock covering an extensive surface; where it was exposed the crystals appeared regularly formed and nearly transparent, a white friable powder was observed on the fracture.

About one mile eastward of this rock large siliceous stones rounded on the surface were found on the road, others appeared detached from larger fragments, the fracture of these was intersected like the siliceous rocks of Kámpák &c.

The road to the mines of Robo passes near the foot of the mountain Puwák whose promontories form the projecting point Tánjong Ráyá. I here had an opportunity to examine some high precipitous rocks which were observable at a great distance from the road. They were granite similar to that found near the other mountains of Bánká, but the component parts were more equally distributed and mostly in small grains; the mica existed in larger proportion and small laminæ of schorl were also perceptible. Externally the felspar appeared in minute parallellograms and the particles of quartz much exceeded it in size. Many of these rocks were observed on the declivities of the mountain Puwák which is here without vegetation for a considerable distance. Near the foot of this mountain and in the vicinity of these rocks, several small mines are at present worked, though the most productive spots have been exhausted and one observes extensive surfaces turned up by mining.

In one of the mines in which the workmen were at this time employed, the ore is found but a few feet below the surface. Under the soil I remarked a layer of white clay containing siliceous particles. It often separated in large masses which had greatly the appearance of the granite of the neighbouring hills in a state of complete decomposition; particle of mica and schorl were distinctly perceived in it. Among the stones at the aqueducts were some siliceous fragments of considerable size, several of these resembled the stones found at Wunhin, but they had generally more consistence. The fragments of felspar had mostly rounded angles, some were botryoidal and the colour of all was white or yellow. Fragments of Breccia were very sparingly distributed.

The last mine which I examined at Robo was near the eastern boundary of the island: the ore is here found within half a mile from the ocean. The stratum commences immediately under the soil and extends on an average to a depth of ten feet; it consists of sand of a dirty yellow and grey colour, through which the ore is thinly distributed: it is not perceptible to the bare eye.

This stratum contained comparatively few large fragments, and those which I found were mostly anomolous in their nature. The siliceous fragments were generally of a deep blue colour, a few were white, and some regular rock-crystals also occurred, besides these I found:

1. A fine grained sandstone intersected with regular lines.
2. A coarses grained sand-stone.
3. Small fragments of amygdaloids in thin plates different both in colour and consistence from the common breccias.
4. A pecies of slate, differing from common slate only by a greater degree of hardness: its fracture, colour and streak are the same. I have not found this species of stone in its original situation or in fixed veins, and I cannot therefore trace it to its origin. This was the only mine in which I found it. The place where the kind of sand-stone here mentioned exists in extensive veins and rocks will be pointed out in the sequel. All the substances occurring at this mine exhibit the appearance of having been carried hither from a considerable distance.

On the course from Sungie-liát to Márawáng I passed between two separate promontories of the mountain Bettung, stretching several miles to the north. This hill continues the primitive ridge from the district of Belinyu (and Lumut) south of the low alluvial

tract which transmits the large river of Láyáng : one arm of this ridge, the mountain Puwák above mentioned, extends eastward forming Tánjong Ráyá, its continuation to the sôuth I followed and met at different points. Leaving the northern hills the road proceeds close to the east side of the mountain Bettung for several miles and then diverges towards the mines of *Robo-kli*.

Large rocks of granite cover the separate hills, as well as the sides of the large mountain ; here the piles are uncommonly large, precipitous or widely rounded resembling both in fracture nnd components parts those found on the tract from Klábbet to Mámpáng : the only obvious difference I remarked was less regularity in the distribution of the felspar. These granite rocks extend to the neighbourhood of *Robo-kli*.

The strata of the mines of this district, which from the remains on the surface appear to have been very extensive, are undoubtedly in conjunction with those which I examined on the road to Robo. Many of the explanatory specimens I collected were of the same kind. The rock, consisting of regular crystals united by a cement of clay, was very abundant, also pure rock crystals, and the earthy substance found in the strata which resembles granite, in a state of decomposition. These I met with in the exhausted mines. Here the Red-Iron-stone was also copiously found and particularly that variety which I have called Breccia or Amygdaloid. Large quantities have been brought up by the miners, some appear to have been found in immediate conjunction, others have doubtless been situated very near the primitive rocks. Several of the fragments which I collected here are of a mixed nature, they consist partly of the crystallized siliceous rock above described and of particles of Red-Iron-stone either entire or in a state of decomposition. One of my specimens is highly characteristic and shows also in this part of the Island the conjunction of the primitive rocks with the Red-Iron-stone or Breccias. In various parts of the further track to Máráwáng I found loose fragments of this stone on a surface of sand.

Those mines of Robo-klí which are at present worked, are of tuated above a mile to the east of the road on which the stockade is- the miners is constructed. On my way thither I passed several large granite rocks. The strata, following the soil, consisted of clay, clay and sand mixed, or sand distributed through fragments of Red-Iron stone. Some of the clay which remained from the last works was

remarkably white and possessed in a great degree the character of pure clay: in some of the masses minute crystals of quartz were imbedded. The external appearance and fracture of the granite rocks near Robo-klí is similar to those found near the foot of the mountain abovementioned, the felspar is irregularly distributed and gives it often a marbled appearance. The specimens I collected from the aqueducts of the different mines of this district were highly diversified, embracing, with the exception of slate, almost every variety hitherto enumerated, as remaining after the process of the washing of the ore. Having passed the environs of these mines, rock-crystals are no longer observed among the stones remaining on the surface or at the canals. The first mines which I examined after entering the district of Máráwáng are indicated by these substances to be situated in a continuation of the strata above mentioned. This is the case with the mine of *Kimsowá*, the largest of the district which has been attempted again after a foumer failure.

In a direction nearly west, about one mile from the stockade, I examined a mine which is of a different nature. In all those I had hitherto visited the strata were composed of substances derived from the primitive parts of the island, and the Red-Iron-stone or Breccias formed comparatively only a small proportion.

This mine existed in a tract composed almost entirely of layers of Red-Iron-stone and the siliceous particles were sparingly distributed. As it was a small mine, and had long been worked, a very extensive plain was opened and exposed to view, intersected by numerous parallel canals, remaining from the successive works of the miners, as the strata were exhausted; these, with the substances disposed over the surface and the sections of the hill, afforded an instrutive view of its constitution.

The substances covering the plain just mentioned were of different kinds; some were flat or tabular with the sides uneven and corroded, the surface covered with a yellow ochre and the fracture dark coloured: some again were irregular, massive, more uneven or grooved on the surface, the fracture shewing a disposition to the formation of nodules (geodes) while the interstices were filled up with an earthy substance; others consisted of minute particles of silex, bedded in reddish ochre possessing different degrees of hardness and adhesion forming a friable Breccia. A few only exhibited a close fracture, resembling the Red-stones of Belinyu. Upon the whole considerable diversity occurred in the substances found at this mine,

and I refer for the the details to the description catalogue. Large masses of red, yellow and whitish clay were accumulated in various places.

Above this plain, exhausted by the successive works of the miners, the ore had been disposed in a stratum, consisting of the varions kinds just described (but smaller in size) and of fragments of quartz which were loose and friable. The particles were uncommonly large, mostly crystallized, many of them had a diameter exceeding one fourth of an inch. In many of the specimens I collected, small particles of ore are adhering to the masses of Red-Iron-stone, it is also found bedded in a substance consisting of decomposed portions of primitive rocks mixed with decomposed Red-Iron-stone. Next to this, proceeding upwards, is a layer of yellow sand 4 or 5 feet deep, containing small particles of ore so thinly distributed that they cannot be perceived by the bare eye: they appear on washing the ore, after this follows a layer of soil of about 12 inches depth.

In order to examine the stratum following the extensive plain above mentioned, I entered one of the latest canals: the sides were completely covered by the ochreous crust from the decomposed surface of its component parts: after removing this, the fragments could be separately taken out or broken off from the larger masses. They consisted uniformly of the Red-Iron-stone just described, the smaller portions were tabular, of various sizes, corroded on the surface, variously excavated, perforated, covered with an ochreous crust, and rounded at the angles. Every thing at this mine shewed plainly the operation of the general agent on the substances and in their arrangement, but the reflections suggested by it will be detailed in the summary of remarks of a general nature, after the description of the other districts.

On the roads towards Pángkál-Bulu, the hill called Gunong Káppu is kept in view almost directly in the south; one traverses the remains of several mines on which the fragments are of a mixed nature, with masses of clay and sand; after which I noticed in various places loose fragments of Red-Iron-stone.

I have not been enabled to determine the substances composing the hill just mentioned and the hill *Sámbunggirí*, but, to judge from their appearance at a distance, the higher parts of both consist of granite. Near the foot of the hill Káppu Red-Iron-stone is found: several fragments were brought me by the natives and described as the stone from which Iron was formerly prepared at Páku.

South of Pángkál-Bulu a large tract of alluvial country is included between the hill Káppu and the mountain Mángkul: the large river of Máráwáng and many of its branches pervade it. With regard to the south-east division of Bánká my mineralogical remarks are very limited I visited only part of the districts of Pángkál-pináng and Tirák.

I shall commence the detail of the remarks made on a route in a south-west direction from the stockade. In the immediate environs the tract is still low and alluvial. The mines of Bákung, situated in the south-west, from the numerous remains, appear formerly to have been very extensive: the detached fragments which I noticed are of a mixed nature, and their origin can be traced to the remaining fixed substances.

I found extensive tracts consisting of veins of rocks of Red-Iron-stone and the canals were often cut through deep layers of this substance. In other parts the surface was covered with that mixture of clay and sand which has frequently been mentioned as forming strata of the mines; on this siliceous fragments were dispersed. I noticed principally:

1. That species of crystallized rock (mentioned in the account of the mines of Sungie-liát and Robo-klí) consisting entirely of quartz, while the felspar appears on the fracture in a decomposed state as a white friable powder.

2. The variegated, often marbled mass, formed of nearly equal portions of quartz and felspar. The promontories of the Gunong Mángkul extend in this direction and the siliceous fragments found at these mines have probably been derived from them.

The layers of Red-Iron-stone at these mines (of Bákung) were similar to those above described at the mines of Sunwan at Máráwáng in arrangement and extent; I remarked here, however, the peculiarity that they were often intersected by extensive veins of fixed rock. The separate fragments resembled externally those found at the mine of Sunwan, but the fracture was different, as well in those fragments which compose the layers as in the fixed rocks; it was more close and compact and the colour varied from a deep reddish brown to nearly black; in some it exhibited a variegated metallic lustre. A few of the detached fragments remaining from the washing of the ore were amygdaloids; those which composed the strata were tabular and externally corroded. In a few specimens I observed the same disposition to form nodules which has

above been noticed. They were generally very ponderous and indicated the presence of much Iron.

The mountain Gunong Mángkul is very distinctly observed from the naked spots of this mine, it is a long extended ridge following the general direction of the island, and intersected by several deep vallies, the further south-east extremity is called Gunong Ládí. It consists of granite, rocks of which are also found in the surrouning tracts. In the fragments which I examined the quartz and felspar are equally distributed the latter often has a reddish tinge ; the mica is more abundant than in many other granites of Bánká.

In a direction south-west of the mines of Bákung the country is slightly variegated by inconsiderable elevations ; many tracts are low and appear to be occasionally inundated, numerous rivulets pass through them. Vegetation is very abundant and the soil a deep black mould, occasionally some loose Red-Iron-stones are observed on the road.

As I approached Tirák I passed several mines none of which were worked at this time ; near the stockade I found numerous remains of former mines, and as their examination terminated my mineralogical remarks in this part of the island, the most southern that I visited, I shall carefully enumerate the substances I observed and collected, in order to shew, as far as my observations extended, their generality on Bánká.

1. A fragment of granite apparently taken from the strata of the mines : the felspar is in a state of incipient decomposition, the whole mass shews a disposition to separate, the surface being burst in many places : most of the mica has crumbled away, and only very minute particles are observed scattered on the surface.

2. A fragment consisting of crystals of quartz semi-transparent, the intervening felspar appearing on the fracture as a white friable powder.

3. Variegated siliceous masses consisting of quartz and felspar nearly equally distributed.

4. Rhomboidal fragments consisting almost of pure felspar.

5. Sandstone of a fine grain with acute angles and regular sides.

6. Red-Iron-stone very ponderous, the fracture exhibiting numerous nodules inclosed by thin laminæ, often double and concentric, containing earthy particles : the insterstices between the nodules are filled up by a dark coloured substance possessing a partial lustre.

7. Iron-stone consisting of nearly regular alternate bands of different shades of colour, the interior often metallic, the exterior earthy or ochreous.

8. Breccias formed by Red-Iron-stone inclosing numerous siliceous particles.

On the surface more universally dispersed I observed:

9. Coarse sand bedded in white and yellow-clay.

10. Black-clay, the substance above mentioned as occurring massive in the strata of most mines.

I made a second excursion from the stockade of Pángkál-pináng in an eastern course; on which I observed occasionally some loose fragments of Red-Iron-stone on the surface. I arrived at the mines of *Krássák;* they are of a description of small mines but no part of the island offers a larger surface from which the ore has been successively extracted.

At two of the works on which the miners had lately been employed, I noticed the following strata and appearances viz:

At the *first:*

Soil.

Fine-sand.

Particles of quartz mixed with sand, a deep stratum.

Clay of different colours white and red. The fragments remaining at the canals were, with few exceptions, of a siliceous nature.

At the second:

Soil.

Fine sand, mixed thinly with clay of a yellow colour.

Layer from which the ore had been extracted, consisting chiefly of large fragments of quartz and coarse sand, next to this, deep layer of variegated clay, red and white; it was intersected with numerous canals that had served for the former works.

Pursuing the investigation of the numerous substances which remained on this extensive district from former works I noticed Breccias (or amygdaloids) accumulated in large heaps near the old aqueducts at which remained chiefly fragments of siliceous stone: the contiguity of these two substances appeared therefore also at these mines. The sections of the ground were mostly concealed by returning vegetation, in one place I remarked a deep stratum of siliceous stones bedded in clay of a yellow or red colour.

Among the substances which I collected as explanatory specimens I shall only notice:

1. The siliceous stone consisting of regular crystals, mentioned in the description of the mines of Sungie-liát (on the road to Robo) of Robo-klí &c., possessing often a disposition to separate into rhombs, pyramids or parrallellograms.

2. The same kind of stone with the intervening particles of felspar of a red colour. *(Note:* the red colour in some of fragments from Gunong Mángkul has been pointed out above.)

3. Fragments of pure compact quartz.

4. An anomalous stone not found elsewhere, consisting of determinate fragments some of which were cylindrical others reniform and irregular with a tubular excavation extending through the whole length: the fracture approached nearest to a very compact, fine-grained sandstone, the colour was light red inclining to grey the external parts, and in some cases intersecting lines, white.

5. Amygdaloids consisting of numerous particles of quartz cemented by an ochreous earth of a brownish red colour of a loose testure.

6. Compact ponderous Breccia of the same component parts.

7. Compact Breccia of large fragments of quartz bedded in a yellow cement which appeared ochreous on the fracture.

Between the mines of Krássák and those of *Messu* the country is generally low and some tracts are partially inundated: these mines are dispersed through an extensive district extending to the boundary of the ocean and but little elevated above its level. Numerous works have been carried on here, some of the strata have extended to the sea shore and probably beyond it.

Very near the discharge of the river of Messu, I met a vertical section of a mine lately worked; under the soil followed a stratum of sand 3 feet deep and next to this one of clay of various colours 10 feet; to the naked surface of this still adhered particles of quartz and fragments of Red-Iron-stone, exhibiting a characteristic view of their disposition in the stratum.

Near the lower part of this section, on a different side of the same mine, I found a large space covered with clay in the highest state of purity in a deep layer, separating spontaneously when removed (according to the lines intersecting the surface) into fragments of a rhomboidal and pyramidal form with regularly defined sides. The colour is yellow, reddish or orange; it is highly unctuous to the touch, and adheres strongly to the tongue if applied to it. In no part of the island I found it in such apparent purity, and the smallest particle of sand is observed in it.

At the shore near the discharge of the river of Messu I observed at a distance the extremity of the hill Ládí (south of Mángkul) forming point Ujong Gunung: the island Pulo Pánjáng lies almost directly east and numerous projecting rocks are seen in that direction. Some were situated near the shore, those which I examined consisted of sandstone of different degrees of hardness; the compact were intersected by lines, one resembled in a great degree the siliceous rock at Kámpák, others were of a spongy texture, and possessed a very small degree of compactness.

The other mines which I examined at Messu were situated about one mile distant from the sea-shore, the workmen were at this time employed in two different places. In one of the mines I noticed the strata as follows:

1. Soil six inches.
2. Black-clay, an irregular stratum with a small admixture of sand, 12 inches.
3. Layer of ore thinly disseminated through siliceous fragments, 18 inches.
4. Sand bedded in white and in reddish clay, about 2 feet containing a small admixture of ore.

Lastly, a layer of very pure white clay.

In another mine:

1. Soil.
2. Fine sand mixed with soil, containing indications of ore.
3. Coarse sand mixed with fragments of quartz, the ore thinly dispersed.
4. Coarse particles of quartz containing the chief stratum of ore, 18 inches.
5. White clay.

Near this mine I observed in one place, numerous particles of quartz immediately under the soil, and in another place a large siliceous rock under the stratum from which the ore had been extracted. Upon the whole the appearances at these two mines showed very clearly and distinctly the manner in which the ore is arranged in, and distributed through, the strata and were very instructive and satisfactory.

The fragments collected at the aqueducts, comprized all the varieties already described of the siliceous kind, the Breccias were mixed only in a small propotion. Among the peculiarities is to be noticed, that the felspar often had a red colour, that regular rock-

crystals were sparingly found but copiously pure transparent quartz in masses, and that some of the detached fragment of felspar had a blackish colour. The specimens of ore here collected display the various forms (or combinations) in which it is found in the strata.

At these mines I terminated my mineralogical remarks in this part of Bánká: it remains for me to detail those I made in my track across the island, between Máráwáng and the mouth of the river of Kutto-wáringin.

After leaving the neighbourhood of the stockade and proceeding in a western direction, the usual appearances are presented. Where mines have been worked the substances on the surface are of a mixed nature, siliceous and Red-Iron-stone. Beyond the mines of *Tshengal* appearances in some measure different from the former are observed; and the subsequent track through the body of the island confirms the indications which are exhibited at Tshengal: here is the boundary, in the west, of the strata containing ore of tin; in that extensive track towards Kutto-wáringin and (northward) to the foot of the mountain Márass no traces of this metal have hitherto been discovered. I have not been able to visit the mountain of Márass the most elevated on the island, but its investigation is an object of importance in elucidating the mineralogy of Bánká. The more elevated parts are doubtless granite, but it will be interesting to examine its southern declivities, to determine the foundation of the accounts of the original inhabitants and of the Chinese, which state that they are devoid of strata containing Tin-ore: if this is found to be the case, they differ from the declivities of the mountain Mánumbing (the next in point of elevation) and from those of all the other mountains and hills of the primitive class, which have been mentioned in the foregoing details, and inclining towards which the most productive mines have hitherto been found.

The Márass forms a long extended ridge divided into two separate mountains each of which has a peak of considerable elevation. The direction is, on the whole, west-north-west to east-south-east: a long extended low range runs off towards the south-east. Of its highest point of elevation I can only form a conjecture, according to which it is, (comparing it with the Mánumbing) elevated 1500 feet above the level of the ocean.

The appearances presented by the remains of the mines of Tshengal are very singular; the spots where they have been worked are covered with large unwieldly fragments of Breccia of great variety

of composition, profusely spread over an extentive surface. They indicate that the miners have met with large veins of this stone in their works in a situation intermediate between the primitive parts of mountain Bettung and the low track which follows on the west. From the traces I noticed on the remaining strata the ore had been disposed superficially, and the Breccias have likewise been taken up near the surface. The fragments were highly diversified, and different in form and composition from the Breccias I had hitherto found; exterior portions were generally in a state of partial decomposition, but in many cases the ore of tin was still abundantly adhering.

The fragments consisted of siliceous stone or of particles of decomposed granite of various sixes united by a cement of the common Red-Iron-stone of the island. The substances observed on the surface are:

1. Particles of quartz of considerable size of the constitution of the crystallized rock abovementioned frequently occurring at the mines in the neighbourhood (for instance at Robo-klí, Máráwáng, &c.

2. Minute particles of quartz more pure and regularly crystallized.

3. Particles of felspar of considerable variety of colour and figure: many of them having a blackish hue.

The surface is very irregular and the fracture presents the substances observed on the surface with many intervening cellulosities, filled with an earthy ochreous substance: some fragments, however were more compact and consisted of more minute particles of quartz. The irregularity of the form, the grossness of the component particles, in comparison with those I had hitherto found, the numerous cellulosities which intervened and the ochreous crust with the compact portions of the Red-Iron-stone, retaining a deep red colour, gave a peculiar characteristic appearance to the Breccias of Tshengal.

After leaving the neighbourhood of these mines I crossed the river of Kándís near its source and entered the large alluvial track abovementioned which transmits the river of Máráwáng and its branches. Several slight elevations are observed at a distance and the road is alternately rising and descending. From Tshengal large rocks of sand-stone are plentifully dispersed through the country, they are externally of a greyish colour and marked by numerous

right-lines crossing and intersecting each other mostly at oblique angles: these lines being of a substance more hard and compact than the rock appear slightly elevated on the surface where the stone has been exposed to the weather. The fracture is white, varying to light red and grey, and presents the lines observed on the surface in a manner similar to the rocks of Kámpák; they appear as a pure white siliceous substance and are very narrow.

The grain of these rocks is fine and their texture compact; their range is probably extensive and the fragments of sand-stone found at many of the mines of Máráwáng and Pángkál-pínáng, are probably derived from them: beyond these rocks I observed a large vein of Red-Iron-stone projecting from the surface, and about 3 miles further I crossed the river of Máráwáng. On the further route towards the vicinity of Dshuruk, very few remarks offered themselves; the tract is, on the whole, low. In one place only I observed a fixed vein of Red-Iron-stone, and in another I found loose fragments on the road: they are both similar in their fracture to the more compact Red-Iron-stones found in other parts of the Island.

Several miles east of the village of Dshuruk an extensive district is partially inundated, and the passage through it is as usual over fallen trees and long slender bridges: this swamp it formed by the heads of the river of Dshuruk not yet united into a common stream. That extensive track which stretches in the central parts of the island towards the mountain Máráss and towards the south-east division of the island is of a similar constitution and gives rise to several rivers, discharging themselves towards the east and west, which are laid down on the Geographical Map. Vegetation in all these central districts is highly profuse and the soil black and fertile.

About half a mile to the east and almost in sight of the village of Dshuruk I found on the hill called Bukit Pungong-ake by the natives, a mineralogical product that I had before not noticed on Bánká. In ascending this hill a stone of a peculiar kind caught my attention, it was different in form and colour from all the substances hitherto enumerated and presenting where it was not concealed regular sides and angles: after removing the soil it became evident that it consisted of many separate portions, and on applying the hammer the larger fragments separated into cubes, parallellograms, rhombs &c, while the same disposition to separate into regular fragments shewed itself in the minutest portions. The whole rock was intersected by numerous lines which indicated the point of separa-

tion: where it was exposed by a new fracture it exhibited a very compact substance of a pure white or reddish colour, and some of the separate particles were elegantly marked or inscribed with various figures by a combination of these two colours.

Although the appearance of this stone was on the first view anomalous, it is by no means difficult to account for its source on Bánká: the same substance which in the more primitive parts enters into the composition of granite appears here as pure felspar, or in combination with substances of the secondary and alluvial districts. It is in some degree modified by the causes which influenced its present disposition, and by the foreign substances united to it: but its configuration and qualities leave no doubt in my mind that it belongs to the class just mentioned. The strong mineral acids do not effect it.

It occurs not only on the ascent of the hill Pungong-ake, but also in large loose fragments at some distance from the road, in different directions. Besides the manner just described, existing in a pure state, I have found it, on the same hill, combined with the Red-Iron-stone of the neighbourhood into a species of Breccia. The fracture here, exhibits the felspar, with its peculiar characters, but the manner in which the Red-Iron-stone is combined with it forms several distinct varieties. In one of these the Red-Iron-stone is compact, ponderous, approaching to lustrous and of a dark brown or blackish colour; in another the Red-Iron-stone is ochreous, friable and of a light red or yellowish colour. I have in some instances found both varieties in one specimen; when the fracture of the felspar, between the colours of the other substances contributed to form a very beautiful mass. Some of the fragments of felspar are pervaded with narrow lines of a black substance of a different kind, while others present enclosed in the usual white or reddish mass a mineral approaching to the nature of horn-stone or flint. In some cases fragments of sand-stone are amited to the portions of felspar.

On the further route across the Island I found above half a mile westward from Dshuruk in the rivulet Ayer-Bulin, numerous fragments of stone which had been a long time exposed to a current of water: the appearance of this confirmed my opinion concerning the substance found on Pungong-ake and these had probably been derived from the same or a neighbouring eminence. Their colour was generally white, their sides and angles regular, though they shewed by the rounded extremities the force of a current: many

fragments were very similar to those I had found at the aqueducts of the mines and which have been described at fragments of felspar. In this rivulet were also fragments of pure quartz and of that peculiar siliceous stone which is intersected by lines of a compacter substance. Continuing the track to Kutto-waringin I noticed on several elevations fixed veins of Red-Iron-stone; in one place in particular, this substance was a blackish colour and uncommonly ponderous, displaying in the fracture a lustre almost metallic. Between many elevations, which are not considerable the whole country is low and occasionally inundated and before arriving at the stockade I passed above a mile through a tract which was completely overflowed. A belt of considerable extent of alluvial tract bounds the western shores of the Island from Támpeláng to Penágán, transmitting besides many others, the rivers of Kutto-waringin and Mendu.

(To be continued)

NOTICES OF THE HISTORY AND PRESENT CONDITION OF MALACCA.

By the Hon. E. A. Blundell, C. S.

History.—The earliest notice of Malacca which I have met with is in the "Navigation and Voyages of Lewis Wertemanus of Rome in the year 1503." The following is the extract alluded to: "Sailing westward towards the city of Malacka, we arrived in 8 days' sailing. Not far from this city is a famous river named Gaza, the largest I ever saw, containing 25 miles in breadth. On the other side is seen a very great island called Sumetra and is of old writers named Taprobina. When we came to the city of Malacka (which some call Meleka) we were incontinent commanded to come to the Sultan, being a Mahomedan and subject to the great Sultan of China and payeth him tribute, of which tribute the cause is, that more than 80 years ago that city was builded by the Sultan of China for none other cause than only for the commodity of the haven, being doubtless one of the fairest in that ocean. The region is not every where fruitful, yet hath it sufficient of wheat and flesh and but little wood. They have plenty of fowls as in Calicut, but the Popinjays are much finer. There is also found Sandilium and Tin, likewise elephants, horses, sheep, kyne, pardilles, bufflos, peacocks and many other beasts and fowls. They have but few fruits. The people are of blackish ashe color. They have very large foreheads, round eyes and flat noses. It is dangerous there to go abroad in the night, the inhabitants are so given to rob and murder. The people are fierce, of evil condition and unruly, for they will obey to no Governor being altogether given to rob and murder, and therefore say to their Governors that they will forsake country if they strive to bind them to order, which they say the more boldly because they are near unto the sea and may easily depart to other places. For these causes we spent no long time here, but hiring a brigantine we sailed to the I. of Sumetra where in few days sailing we arrived at a city named Pidir distant about 80 miles from the continent or firm land."

The next extract which I will give is from the travels of Cæsar Frederick, under date 1564:

"Malacca is a city of marvellous great trade of all kind of merchandize, which come from divers parts because that all the ships that sail in these seas both great and small are bound to touch at

Malacca to pay their customs there, although they unlade nothing at all, as we do at Elsinor: and if by night they escape away and pay not their custom, than they fall into a greater danger after, for if they come into the Indies and have not the seal of Malacca they pay double custom. I have not passed further than Malacca towards the east, but that which I will speak of here is by good information of them that have been there. The sailing from Malacca towards the east is not common for all men, as to China and Japan but only for the king of Portugal and his nobles, with leave granted to them of the king to make such a voyage or to the subscription of the Captain of Malacca. These are the king's voyages that every year there departeth from Malacca two Gallions, one of them goeth to the Moluccas to lade cloves and the other to Banda to lade nutmegs and maces."

The next extract from aneient voyages which I will make is from that of Newhoff in 1662:

"The capital city is likewise called Malacca, being the same in former times called "Jakola." It lies under 2. 30 in a bay at the ascent of a hill on the west side of the river Muar (otherwise called the Gaza and Jyga and Kroisant or as the Dutch exprest it Kriesarant) which having its rise deep in the country divides the castle from the city and washing its walls falls with a rapid current into the sea. Cross this river is a strong bridge built of stone with several arches. * * * It is very populous. * * *

"The king of Johore besieged the city in 1606, with 60,000 men, the Portuguese having maintained themselves there till 1649, when the Dutch after a siege of four months made themselves masters of it after the Portuguese had been in possession 130 years.

* * * * *

"The foundation of Malacca was laid about 250 years before the arrival of the Portuguese in India. About that time one Sangsinga reigned in Sinkepure situate under 50 minutes of north Latitude and in the neighbouring country of Java one Paravisa who at his death left his sons under the guardianship of his own brother, their uncle, but he having found occasion to murder the eldest, usurped the throne at which some of the noble Javanese being highly disgusted did, with Paramisora their late king's youngest son, fly to Sinkepure where they met with a kind reception from Sangsinga, but it was not long before Paramisora in combination with his Javanese murdered Sangsinga and put himself in possession of his kingdom.

The king of Siam being highly exasperated at the treachery against Sangsinga his vassal and son-in-law, forced the Javanese to quit the country who being now obliged to seek for a new habitation, settled themselves near the river Muár where they built a stronghold call-Payopayo, beside the Javanese Páramisora was followed by 2,000 others called Cellati who live upon fishing and robbing, but though they had been very instrumental in Sinkepure he did not think fit to receive them within his new built city, which made them settle their colony about 3 or 4 leagues from the river Muar, not far from where Malacca now lies, where they joined with the inhabitants who were half savages, since which time their language is called the Malaya language. But when they became straitened for room some of them settled themselves about ¼ of a league from thence on a hill called Bitan surrounded with a large plain. Paramisora being taken with the conveniency and pleasant situation of this place, abandoned Payopayo and transferred his colony near this place, which afterwards was call Malacca, i. e. banished persons, in memory of the exiled Javanese."*

" Saguan Dorsa son of Paramisora succeeded him in the kingdom, and, having submitted himself as a vassal of the king of Siam, reduced the whole country of Sinkepure to the east as far as Porto on the isle of Zambilan which lies west of Malacca a tract of land 40 leagues in length. His successors found means to shake off the yoke of Siam especially after they were, by the Persians and those of Sinat brought to the Mahomedan religion. The king of Siam in 1502, about 9 yenrs before the Portuguese became masters of Siam (Malacca?) did attack the king of Malacca with a fleet of 200 sails, aboard of which where 6,000 soldiers under the conduct of the Goveinor of Sizor but the fleet was scattered by a storm."

" The harbour of Malacca is one of the finest in all the Indies, being navigable at all the seasons of the year, a conveniency belonging scarce to any other in the Indies. Whilst the Portuguese were in possession of it, this city was very famous for its traffic and riches in gold, precious stones and all other rarieties of the Indies. Malacca being the key of China and Japan trade and of the Molucca islands and Sunda. In short Malacca was the richest city in the Indies, next to Goa and Ormus."

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* In a note page 328 of Marsden's Sumatra this account of Malacca is denied all credit when contrasted with that given by Valentyn and others.

" The Portuguese used to take ten per cent, custom of all ships passing that way whereby they got vast riches, but the Dutch E. I. Co. has abolished this, looking upon it as an unreasonable imposition and are contented to traffic there. Melacca is a country producing but very little itself, but must be looked upon as the staple of the Indies. * * * In short there is such a vast traffic and concourse of merchants here that from them probably it got the name of Golden Chersonensus among the ancients, Melacca being certainly the richest harbour that can be seen, for formerly and to this day the merchants were so rich here that they used to compute by no less than by bars of gold."

* * * * *

" Sinkepure lies on the most southern point of all Asia, about half a degree to the north of the line and 20 leagues from Melacca. * * * To the south of Melacca is a small island of about half a league in compass, by the Portuguese called " Isle das Pedros" and has good water. About half cannon shot from the city another small island called Melacca and by the Portuguese called Isle das Nâos or Ship Island. Two leagues from Melacca is a pretty large island called Sapta."

The following few extracts are from the voyage of Dr. John Francis Gomelli Careri, who seems to have visited Malacca in 1505:

" Melacca is situated in 2. 20. N. Lat. It contain about 5,000 souls, most of them Portuguese Catholics, better instructed in matters of faith, than any in Europe, there being children 10 or 12 years old that answer in questions concerning religion as solidly as a divine could do. * * *

" The city gives laws to all ships that pass the Straits, obliging them to pay anchorage whether they put into the Port or not. Spanish and Portuguese ships pay 100 pieces of eight each, others less. The Dutch are so hard upon these nations because they say they paid as much when the Portuguese were masters of it. The English are not only free from the burden but much honored * * * The Port of Malacca is very safe and has a great commerce from east and west * * * The dominion of the Dutch reaches but 3 miles round the city because the natives being a wild people living like beasts they will not easily submit to bear the Holland yoke. They are called Menancavoes, very great thieves. Their king called Pagarioyou has his residence at Nanning a village made with mats, ill put together in the thickest of the wood. No better

account of their country can be had, from want of commerce with them."

Ere I make any remarks on these old accounts of Malacca, I would refer to the only two native manuscripts which I have had the opportunity of perusing in which reference is made to the foundation of Malacca. The first is the Historical Romance of Háng Tuáh, from which we learn that a colony from Palembáng settled in Béntán, under one of the Princes of the Royal House of Bukit Siguntang, and that, after some years, the Prince undertook a grand hunting party with the view of fixing upon a site for a new capital. He is described as leaving Béntán with a fleet of boats and landing on Pulo Ledang where, during a hunt, a white moose deer suddenly disappeared, which was considered a decisive omen of this place being most suited for a Capital. The Island was ordered to be cleared and the officers to whom the execution of the work was entrusted fixed upon a spot where grew a Malacca tree as the site of the King's Palace, whence the place was subsequently called Malacca. No dates or means of affixing any date are given in the narrative.

The second Malayan manuscript which I have perused is one of which great use has been made by all who have attempted to give anything like a connected narrative of the earlier periods of the Malayan states. Marsden in his History of Sumatra page 327 gives nearly a literal translation of this document, not however as a translation, but as an abstract of the information gleaned by him from the works of certain Dutch Authors* relative to Malayan History, from early times to the conquest of Malacca by the Portuguese, in 1511. Newbold gives a continuation of this same document under the appellation of "Katurunan" or "genealogy of Johore" from the conquest of Malacca to the disputes between the Dutch and English relative to Singapore. The authenticity of this document becomes a matter of some importance to those who may be interested in the subject of the Malays, and in my opinion it is, for many reasons, open to strong suspicions of being of European manufacture. That it is not a genuine Malayan document is evident I think from the precision of dates, the uninterrupted succession of hereditary Princes during a period of 700 years, and the absence of all supernatural agency. Be the value of this last manuscript what it may, I am inclined to conclude, from a

* Valentyn and others.

consideration of all the foregoing accounts, that the present site of Malacca is not that on which the Malays from Béntán or Sinkepure first established a town of that name. The point is one of too slight importance or interest in these days to deserve the trouble of elucidation, but the circumstance mentioned in the romance of Háng Tuáh is worthy of remark, that the first settlers from Béntán fixed themselves on an Island containing a mountain called Gunong Lédáng (the name of mount Ophir), leading to the supposition that in their days, the sea covered much of what is now dry land. May not the degree of credit due to this statement, be coupled with that due to the early European Voyagers relative to the excellence and conveniency of the Port of Malacca, and lead us to infer that the aspect of this coast in the 15th. century must have been something very different from what it now bears.*

A perusal of Albuquerque's reports to his government relative to his conquest of Malacca, should they exist either in Lisbon or Goa, would certainly prove extremely interesting. He must have been gifted with rare genius and great political foresight, to have determined, so soon after the discovery of the route round the Cape and so immediately after his own arrival in India, on obtaining possession of so remote a spot as Malacca, but he must have viewed that spot with the eye of a statesman, as giving his country the command of the whole trade of the Eastern Seas, and for upwards of a century his views were fully realized. Much has been said of the gallantry displayed in the attack, and of the devoted bravery of the Malays in the defence of the place, but it is probable that the lapse of time has tended to throw a halo of romance over the affair. Crawfurd, on the occasion of his visit to Malacca in 1821, says "we cannot, as Europeans, but survey with pride the spot on which stood the bridge by which Albuquerque at the head of 700 Europeans stormed walls and intrenchments that were guarded by 30,000 barbarians." The 700 Europeans, 30,000 barbarians and the intrenchments seem all equally imaginary. Could so large a body of Europeans have been spared from Goa in 1511, and how can we reconcile 30,000 fighting men, behind walls and intrenchments, with the

* See some remarks on the changes which the coast of Malacca has undergone, *Sketch of the Physical Geography and Geology of the Malay Peninsula*, ante p. 125. We think it is probable, from the present appearance of the coast, that it has, on the whole, considerably retrograded during the last 3 centuries. ED.

account given of the place in 1503? Judging from that account, the probability is that Malacca was then a nest of pirates and lawless marauders under a nominal government, and that Albuquerque, seeing the advantage they derived from their position, determined to exterminate them and substitute the more powerful command of his own country. The Malays however would not put up quietly with the intrusion of the Europeans in their country, and for upwards of a century their efforts were unceasing to regain possession of Malacca. Common cause seems to have been made by all the Malayan states to effect this object, but without success, though on one or two occasions they seem to have been on the very point of succeeding and the place to have been relieved by the merest chance. During the latter half of the 16th. century the Achinese seem to have been the leading Malayan state, and the accounts that are given of the armaments fitted out by them against Malacca, (vide Marsden's History) would lead to the belief that Acheen was a very rich and powerful kingdom, but great allowance must be made for the exaggerations of native writers and for the credulity of Europeans in these times.

That Malacca withstood many sieges during the rule of the Portuguese is no doubt very true, and that some fighting may have taken place on these occasions outside the walls, is probable, but that any attempt was ever made to batter or to storm the walls or intrenchments, I do not believe. Such a mode of fighting does not accord with Malayan ideas, and is never found mentioned in their writings.

The Portuguese rule seems to have been confined within a very small circle round their Fort, nor do we hear of any attempt being ever made by them to extend their dominions, yet one might suppose that Albuquerque's genius, suppported by 700 Europeans, would have found no difficulty in obtaining the absolute rule over any extent of country he might have desired in these parts. But no doubt he was content with the command of the sea, and thought the land not worth the conquest.

In 1640 the Dutch, as allies of the Malays of Johore, drove the Portuguese out of Malacca and retained possession of it themselves, from which time to the present we hear no more of sieges and blockades of the place, yet the Dutch, or indeed any European power of those days, could hardly have found more favour in native eyes than the Portuguese. It may have been that they lost no time after ob-

taining possession in strengthening their position to such a degree as to render utterly hopeless all native attacks on it, and truly the remains of their fortifications, now to be seen here, evince the determination to render Malacca perfectly impregnable to any native attack. At the same time the Dutch appear to have exerted the influence of their position and power to obtain an ascendency over the neighbouring states, with the view of establishing in them a monopoly of produce, especially of Tin, then almost the sole known arti- of produce. Judging however from the account given by Dr. Gomelli Careri, it would appear that during the first 20 or 30 years of the Dutch rule, Malacca must have been neglected and mismanaged, otherwise it is difficult to imagine a place that had been so renowned, having dwindled to a population of 5,000 souls, shut up within their fortifications and surrounded by half savage people. But towards the end of the 17th century, if it had thus fallen off, it revived very considerably, and continued to prove a most valuable settlement to the Dutch, till about the period of our establishment in Pinang, when of course a large portion of the trade that had thitherto resorted to Malacca was attracted to the new English settlement. The establishment of Singapore soon drew off what little trade remained, since which, Malacca has gradually fallen into the lowest depths of neglect and insignificance, so much so, that soon after it came into our possession it was seriously proposed to abandon it, and remove the inhabitants to Pinang, and, in our own time, it has been said that a similar measure has been advocated in favor of Singapore, but leaving aside the wanton cruelty of such an act, those who may have advocated it evinced their own great ignorance of the advantages of such a position as Malacca.

In 1825, after several shifts between Dutch and English, Malacca was finally incorporated by treaty with the British dominions in the east, since which, her decline has been uninterrupted, and her history a mere record of that decline, with the episode of what was called the Naning war, of which no one is very proud except a few native chiefs who still chuckle with delight at the idea of having caused the English to retreat. Those who are desirous of learning the cause, conduct, and termination of this war, may be referred to Newbold's pages, where they will find that the cause was the non-payment of a tribute of 400 Gantangs of paddy, value 12 Dollars, that the conduct of the war cost somewhere about twenty lacs of Rupees, and that it ended in pensioning the rebel chief on a hundred Rupees

a month, a larger sum of money than the man had ever before possessed at one time.

REVENUE.—The earliest account of the Revenue and Expenditure of Malacca which I have met with is given in a "Note" in the voyages of Stavorinus from which the following is an extract: "Governor Messel stated the charges of Malacca in his time at 102,000 florins, and the Revenue at 89,000 (about 90,000 and 78,000 Rs.) In 1779 however, the former amounted to 113,000 florins (99,000 Rs.) and the latter to 162,000 (142,000 Rs.) leaving a balance of 49,000 florins (43,000 Rs.) This Revenue proceeds from duties on Imports and Exports, a great trade being carried on here by the Indians and free European Merchants of all nations, and from the profits on goods sold by the Company (Dutch.) Of the Export duty of 6 per cent, $\frac{1}{4}$ is allowed as perquisites to the Company's servants, of which the Governor has 40, the second in command 15, and the rest is distributed in different proportions to the inferior officers. The Governor has also an allowance of one guilder per picul on all the tin collected. A large quantity of this article, 3 or 400,000 ℔s is purchased here every year at about 56s. per cwt. which is generally disposed of in India. In 1778 however 100,000 ℔s was sold in Holland at 74s. per cwt.

"The territorial extent of this Government is not great. It is confined to the city of Malacca and the neighbouring small province of Péráh, where the Company have a fort for protecting the collection of Tin which is dug there."

Considering that about 1779, were probably the palmiest days of Malacca when she had no rival in the Straits, this amount of Revenue seems very inconsiderable, but probably the Dutch Company's servants, who divided these perquisites among themselves in lieu, no doubt, of salary, were, like the servants of a rival Company of those days, not very particular in accounting to their hon'ble masters for the Revenue that passed through their hands. An Export duty of 6 per cent (what the Import duty was, is not mentioned, but probably it was the same) ought to have realized on the whole trade of the eastern seas concentrated in the place, much more than 142,000 Rs. even supposing that sum not to include the "perquisites." Probably these sums which are given as the whole Revenue of the place, denote merely the amount of customs, for in 1815, long after the establishment of Pinang had affected the trade of Malacca, the customs are stated by Newbold to have realized 50,590 Dollars.

Assuming the above quoted statement to be correct and following those given by Newbold in his work, it may be interesting to see at a glance the various fortunes of the Malacca Exchequer:

Year.	*Revenue.*	*Expenditure.*	*Overplus.*	*Defny.*	*Nation.*
1779	$ 142,000	$ 99,000	$ 43,000	$ „	Dutch.
1807	182,000	173,000	9,000	„	English.
1818	165,000	158,000	7,000	„	Do.
1821	154,000	unknown	„	„	Dutch.
1831	48,000	164,000	„	135,000	English.
1847	73,000	141,000	„	68,000	Do.

The present revenue of Malacca consists almost wholly of what are called Excise Farms, which are nothing more than the monopoly of the retail of Opium, Arrack and Seree leaf, the two first turning the vices and the latter the luxury or rather necessity of the people to the account of the treasury. The lands which ought to yield something to the exchequer, have for the last 20 years, proved a dead loss on our hands, owing to causes which will be explained hereafter, but of late the duty derived from the collection of Tin, which may be called a produce of the land, has tended to place the balance of the land revenue account on the right side.

The following is an abstract of the revenue for the past year:

Excise Farms,.....	$ 52,956
Land Revenue,.....	2,660
Tin Duty,.....	10,802
Court Fees,.....	5,431
Sundries,.....	1,280
	73,129

To the above sum must be added the amount collected during the year on account of assessment on houses, lands, horses, carriages, &c., for though nominally this fund is kept distinct, under the tittle of a Municipal Fund, yet to all intents and purposes it must be considered as a portion of the government revenue, for it is levied by authority of government and is disbursed by government officers. The amount for the past year was Drs. 15,820 which added to the other items of revenue gives a grand total of 88,949 Dollars.

The amount given in the preceding statement as that of the ex-

penditure of Malacca during the past year is wholly a fictitious sum, as it includes several items that ought not to be included and excludes others that ought to appear in it. It does not include the expense either of the Military or of the convicts, both of whom cause bonâ fide indents on the treasury, while it does include portions of the pay of the Governor, the Recorder and the expences of two steam vessels, none of which are actually drawn from the Malacca Treasury. Neither does this statement include the sums paid by the Assessment Fund. The result of these various inclusions and exclusions will give the real expenditure of Malacca during the past year as follows:

General	57,000
Judicial and Police	30,000
Military	47,000
Marine	6,000
Land Redemption and Pensions	20,500
Convict Department	8,500
	169,000

To this must be added the following nominal charges, that is, expenses debited to Malacca, but not actually disbursed by the local treasury:

Military charges paid at Madras,	20,000
$\frac{1}{3}$ Salaries of Governor, Recorder and their establishments	34,000
$\frac{1}{3}$ Expences of two Steamers attached to the Straits,	16,000
	70,000
Making a Grand total of,	239,000

This certainly tells heavily against Malacca, in the General Books, but it may be doubtful how far the latter nominal charges can justly be made against her to such an extent, considering the very disproportionate share she obtains of the services of either functionaries or steamers compared with the other settlements, but this is matter of account and adjustment, and the general result may be inferred to be that Malacca pays about one half of its expences, and therein does as well as her neighbours. But it may be said that Malacca is as yet far from having made good all her resources, she has got vast tracts of fertile land to be brought into cultivation, and with capital and enterprize once fully directed in that quarter, it is probable she

would ere long be able to exhibit a revenue equal to all her expences.

LANDS.—The subject of land tenures and revenue in Malacca is one of very considerable complication and not at all understood out of the place itself. As the evidence of Mr. Leonard Wray before the committee of the House of Commons on the subject of Sugar cultivation may tend to bring Malacca into notice as a sugar producing country, I will make no further apology for endeavouring to render the subject of the land tenures one of readable interest.

During the period of the Dutch possession, Malacca was considered a mere outpost of the supreme colonial government in Java, for securing Dutch supremacy and monopoly in the Straits, and not only was agriculture discouraged but it was absolutely prevented. The cultivation of grain was forbidden as interferring with monopoly in Java, and other species of tropical cultivation were equally disallowed from the same cause. Land consequently was of little or no value, and it seems to have been recklessly granted away by the Dutch local government to all applicants for it. In 1825, when we finally assumed possession of the place, it was found that the whole of the lands of the interior had been granted away to private individuals,* and not the lands alone but the right of levying the customary Malayan tax on them. That tax is ten per cent upon produce of every description obtained from the land, and it seems that the proprietors (either by direct grant, or by inheritance or purchase from direct grantees) levied or considered themselves to have the right to levy, ten per cent upon such produce as the land yielded at the time we took possession in 1825. It was not however till 1827, when Malacca was placed under the government of Mr. Fullarton, that any detailed investigation was made into the respective rights of government and of private individuals. The proprietors were called upon to produce their grants, but not one was forthcoming. This was accounted for by the operation of the Dutch system of registry, whereby, on a transfer or inheritance of land, the original grant and all prior deeds of transfer were deposited in the Record Office. The system was no doubt good, but unfortunately the Dutch carried away all these records with them.

Mr. Fullarton seems to have been very doubtful of the legality of

* It is curious that nothing seems to have been known, or at least said, about these Grants during our previous possession of Malacca of several years.

the tenures of these proprietors, and at the same time much puzzled to determine what their rights exactly were, for none of them could distinctly tell. It had never been worth their while, in the Dutch time, to ascertain their rights with any precision, and now that land was becoming valuable and their rights of importance to themselves, they had not the means of defining them. A meeting of proprietors was called by the local government in 1827, with the view of obtaining information on the subject of their rights over the lands in the interior.

1st. As between government and the proprietors:

"On a reference to the records in the Registrar's office, it would appear that some grants expressly state the right of government to resume the land, and all, so far as the inquiry has gone, seem to indicate an ultimate right of this nature.

"The grantee by the records, is generally supposed to receive the land under an engagement to clear the same of jungle, and the right of resumption on the part of government would seem to arise from the non-fulfilment of this expressed or implied duty on the part of the grantee.

"In regard to this claim, implied or seemingly understood in favor of government, the present proprietors state, that without questioning the absolute right of Government on this point, they consider themselves as possessing, in equity, a full and inviolable title to their grounds, insomuch as the land has been sold to and handed over during a series of years to various individuals, without any mention being made of such inherent reservations affecting their title. On being required to produce their title deeds and grants, the present proprietors can only shew bills of sale. They state that all sales or transfers of land were made in the Court of Justice, which body detained all previous papers and deeds on delivering the bill of sale or transfer, and that the court did not intimate to them the above reservations, which it was their duty to do if such a right be recognised on the part of government.

"The proprietors acknowledge that they consider themselves bound, on the requisitions of government, to keep in repair all established bridges and roads running through their grounds, and to clear the banks and bed of the river bordering on their estates from nuisances, but that all new roads are to be constructed at the expense of government, who can carry such roads through any part of the estate, after intimating their intentions to the proprietor of the soil.

"The proprietors acknowledge also that in cases of emergency (if any such should occur) they are bound to provide for the peace of their respective estates by embodying a police from among their servants."

2nd. As between the proprietors and the tenants:

"The tenant settles on an estate by the verbal permission of the proprietor. There is no express law as to the rate of rent payable, but the custom in general is for the landlord to receive 10 per cent upon all the produce of the soil.

"During the Dutch administration the inhabitants were not permitted to cultivate rice, and the produce of estates consisted chiefly of fruit, wood and charcoal.

"A tenant may sell transfer, devise &c, the portion of land he may cultivate and he is free to cultivate the soil to any extent.

"The landholder possesses no right to establish his own mode of assessment or revenue whether as to time or place or rate. In the collection of these tithes some proprietors farm out their revenues and others receive them through their agent."

On these statements it was observed by Mr. Fullarton, then governor of the Straits settlement.

"These descriptions are quite inconsistent with each other. The tenant it appears cannot settle on an estate without the consent of the proprietor; it appears also that there is no settled law for establishment of any particular rent, but the custom is 10 per cent, but of what nature is this custom? Is it custom and prescription usage strong as law, or merely the usual practice of the proprietors to receive a 10th. because they cannot or will not exert themselves to get more. If the tenant cannot settle on an estate without the consent of the proprietor, it follows that the latter may make his own terms as to rent and payment. It is said that the landholder possesses no right to establish his own modes of assesment whether as to time or place, but this is quite irreconcileable with the title and power of a proprietor and with the admitted one of preventing any one from settling on the estate without his consent. The paragraph which follows is alike inconsistent and irreconcileable with the title of proprietor, vizt. that the tenant may sell, transfer, demise &c, the portions of land he may cultivate, and that he may cultivate the soil (that is in fact the soil of another, the proprietor) to any extent.

"The very unsettled and undetermined state of relative rights—questions that in other parts of India have excited endless enquiry,

discussions and controversy,—is a proof of the very low consideration in which the ownership of land is held in Malacca."

A few months after this a document was brought to light, which seems to have satisfied Mr. Fullarton's mind as to the nature of the rights of the so called proprietors over the lands of Malacca. This was a proclamation issued by the Dutch government in 1819, referring to one in 1773 which expressly interdicts and prohibits proprietors from levying more than one-tenth of the produce from their tenants. From this it was concluded that the government of the day gave up to the proprietors, not the absolute right or ownership over the land, but only the government right over it, that is, the tax of one-tenth of the produce.

Considering the important question to be thus settled, Mr. Fullarton determined on negotiating with these proprietors for the retransfer to the government of this right of levying one-tenth of the produce from the tenant, and the following is a summary of the arguments on which he founded that measure:

"The object of the Dutch government in assigning to the persons designated as proprietors, the right of levying one tenth, probably was to make it the interest of certain individuals to introduce, encourage and extend the cultivation of the land, but it appears that so far from taking any pains for that purpose, they never even visited their estates, that they did not themselves collect the tenth, but rented it in the mass once a year to a China contractor by public sale, who having only one year's interest in the country extracted from it the utmost he could, and it appears that an excess is sometimes levied, beyond the tenth, moreover that services are required and labor exacted from the tenants, in short they are kept in a state of vassalage and servitude quite inconsistent with the encouragement of cultivation. The right of levying the government tenth carries with it all the real power of the state; that right vested in the Dutch proprietors, by them transfered in the mass to Chinese, has established a power and influence in that class too great ever for the officers of government to hold in check. The advantages therefore which would result from the redemption of the rights of Government are too obvious to require farther illustration."

During the course of the year 1828, nearly the whole of the lands were thus redeemed at a total cost of 17,354 Rs. per annum; separate calculations were made founded on the best information that could be obtained of the then probable value of the tenth leviable from

each estate, and offers made to the proprietors accordingly. There is no doubt that the calculations were ill founded and the offers too liberal in the then condition of the estates, and the whole transaction has been greatly blamed as ill advised, premature and extravagant, but Mr. Fullarton was not actuated by mere considerations of temporary profit and loss to the Treasury. He looked far higher. He viewed Malacca with a statesman's eye, and saw at a glance all the advantages she enjoys from position, ancient name and fertility of soil. He looked forward to the time when by good management, by the judicious exercise of our natural influence over surrounding states, by the liberal encouragement of agriculture, and the removal of all impediments in the intercourse with her neighbours, Malacca might regain some portion of her pristine splendour,—not as formerly as a commercial emporium, that had quitted her for ever, vanished with the establishment of Singapore,—but the less brilliant though far more solid splendour of the capital of an agricultural country. He would have made her the seat of government of the Straits settlements, and in a few years would no doubt have realized his expectations of rendering her the granary of the Straits. The subsequent history of the lands will shew how very partially these views were carried out, and how cruelly the subject has been neglected and mismanaged.

The transfer of the several estates to the government having been duly effected, the next step was to endeavour to realize from them an amount of revenue equal to that engaged to be paid to the late proprietors, but it was soon found that of this there was little or no chance. Toll houses were erected in different parts of the country to intercept all produce as it was carried to market, and a large establishment was entertained for the collection of the tenths, but the result was always far below the sum required to made good the payment to the proprietors. In 1835-6 according to Newbold, the receipts were 10,983 Rs. collected at an expense of 4,257, and he farther shews that up to that period the ceded lands had occasioned on an average a dead loss to the state of upwards of 10,000 Rs. annually.

About this time Mr. Young of the Bengal civil service was appointed a commissioner to examine into and report on the subject of the lands generally throughout the Straits Settlements. He seems to have brought to notice the very objectionable system of levying a revenue in kind on the produce of the lands, and to have induced the resort to a commutation of the tenths into a money payment, but

unfortunately the mode adopted either by or through him, was one that proved most unpalatable to the natives of the place, and by its enforcement led to much vexation and dissatisfaction. This novel mode of raising a land revenue was by means of technical English legal indentures between the tenants and the East India Company, drawn up with all the precision and formality of a practising attorney in England, whereby the tenant engages to pay so much per annum, and the E. I. Co. engages not to demand any more, during a period of 20 years from the date of signing. This legal document occupies the whole of one side of a sheet of foolscap, while the other is filled with Malayan writing purporting to be a translation of the English, but, as may well be supposed, failing entirely to convey to a native reader any idea of its meaning. It requires some knowledge of law to understand the English original, considering that it is drawn up in strictly legal terms, and the attempt to translate those terms into Malay has produced an utterly unintelligible jumble of words. Indentures being duplicate ducuments are of course required to be signed, sealed and delivered in duplicate by each party in the presence of witnesses. To secure therefore the payment (often of a few annas only per annum) the tenants (ignorant Malay peasants) were sent for in shoals to put their marks to these sheets of foolscap paper filled with writing. They naturally got alarmed and evinced the greatest reluctance to affix their signature. To overcome this reluctance and to induce a general signing throughout, seems to have been the great and almost sole object of the Land Department from that time to the present. All the ingenuity of Residents and Assistants has been exerted to this end and all the principles of political economy have been exhausted in endeavouring to explain the advantages of the system, but in many parts without success. Threats, coaxings and explanations have been set at defiance, and an obstinate determination evinced not to sign these legal papers. In 1843 or 44, the then Resident hit on the notable plan of punishing the recusants for their contumacy by putting their tenths up to auction and selling them to a Chinaman, the very thing that formed one of the grounds for redeeming the lands from the proprietors! This system has been followed ever since, and every year the tenths on the uncommuted lands are disposed of by public auction. The pecuniary result of all this complicated machinery is very lamentable. For the two past years 1846-7 and 1847-8, the nominal sum engaged to be paid on the commuted lands was, Rs. 14,437.

The amount actually received from them during two years was,	1,237
Sale of tenths on the uncommuted lands during the two years,	5,884
	7,121
Actual receipt per annum,	3,560

Shewing that up to the latest date, so far from any improvement having taken place in the dead loss to the state noted by Newbold in 1835-6 by the redemption of the Malacca lands, that loss has continued to increase, notwithstanding the well known increase in the quantity of land brought under cultivation. How far this dead loss may be considered unavoidable or to arise from mismanagement of some kind, may be judged of from the following facts. The last census gives a population exceeding 60,000, and the last returns give an *Import* of 2,500 coyans of rice. Now 60,000 souls, at a moderate calculation, will consume 5 millions gantangs of rice, per annum, from which deduct the Import (2,500 coyans or 2 millions gantangs) gives a local produce of 3 millions gantangs of rice, equal in value to a lac and a half of Dollars. A fair levy of the tenth on this produce, without including all other kinds of produce, ought to yield something far beyond the present nominal land revenue of Malacca, and quite enough to secure Mr. Fullarton's name from the charge of reckless extravagance which it has been the fashion to attach to it on this subject. One important error however seems to have been committed in this redemption of the lands, that of not redeeming the whole of them. Whether those unredeemed, were left so by chance or design, it is impossible to say, but the consequence is still farther to complicate the subject of the Malacca land. To a stranger visiting Malacca with a view of engaging in cultivation, the state of doubt and confusion pervading the whole question of the lands would prove very discouraging. One may imagine such a person travelling through the country in quest of an eligible spot for his contemplated operations, and enquiring as he goes along "This is a fine piece of land, I suppose I may take and clear it, if I wish it?" "You must obtain the permission of so and so, because this is what is called unredeemed land, supposed to have been granted away by the Dutch government to private individuals, and which was not redeemed by the English government

at the time the majority of the land was so redeemed. You may settle on the land if you like, but the so called proprietor will have the right of levying ten per cent on your produce." "What land is this?" This is what is called redeemed land, that is, the government and not a private individual, has here the right of levying ten per cent upon your produce." "And this land?"—"This is occupied already, there being several people who have signed commutation deeds to pay so much per annum for it." "But the ground is uncleared, how can they afford to pay such sums?" "Why the truth is, they have never been called upon to pay since they signed the papers, and probably when called upon to do so they will give them up to be cancelled, but till then, they must be looked upon as the proprietors." It is to be feared the stranger might get somewhat alarmed at these apparent varieties of landed tenures, though in reality he would have no ground for such alarm. The unredeemed lands are too small in extent (not probably our twentieth of the whole) and already so far occupied as to preclude their being selected for any extensive cultivation, and with regard to other lands a simple arrangement would clear away all difficulties. If the locality selected be uncleared and unclaimed land, it is then to be understood that the government have the absolute disposal of it, together with the right of levying ten per cent on the produce, which latter right would be commuted for with the intending occupier at a rate to be determined upon between him and the local authorities. Whatever might be those terms, a grant would be given to the occupier of the land selected (after measurement to ascertain its area and boundaries) giving him the absolute right to, and disposal of, the land, so long as Malacca continues a British settlement, on condition of his paying annually what may be agreed on in lieu of the right of government to levy ten per cent on the produce. If the land selected (or any part of it) is already occupied, and the tenants in possession be purchased out, no difficuty would occur either in transferring to the purchaser the terms on which the old occupants had commuted, or in cancelling them and framing other conditions. Of course an intending cultivator of this land could not be allowed to occupy land which has already been cleared by others whether those others have any documents of possession to shew or not, but it is not likely that such cleared lands would be fixed upon amid the many thousands of acres of uncleared rich virgin lands that are available throughout the country. Malacca is

estimated to comprise about 1000 square miles, say 600,000 acres. Of these probably (I say probably because the whole subject has been so neglected that the books of the Land Office afford no means of obtaining any thing like an estimate even of the extent of land under cultivation) not more than 30,000 acres are under cultivation at present, and allowing for roads, rivers &c. there are some 500,000 acres of first rate land available to the agriculturist. Of the fertility of the land of Malacca no one can doubt who has travelled into the interior, nor of its admirable adaptation for every species of tropical cultivation. The climate is noted as being one of the most salubrious in India and labour is easily procurable. It is indeed surprising that under all these favorable circumstances, Malacca should have continued so completely unknown, till lately, when some sugar planters visited the country, and were fully impressed with the great advantages it possesses for that cultivation. One of them has recorded their impressions in his evidence before a committee of the house of commons, wherein he asserts that Malacca is the finest sugar country in the world. There may possibly be a little exaggeration in this, but at all events it is a proof of the favorable impression made on the mind of an experienced judge in such matters, by a visit into the interior of Malacca. Few, wonderfully few, are the persons who know anything of the interior of Malacca. Even the residents in the place, themselves, are mostly ignorant of its capabilities. Strangers visiting the place and perhaps seeing no more of the interior than is visible during an evening's drive, go away with the impression that it is all very pretty, but at the same time very dull and lifeless. True, indeed, it is but a lifeless prospect, but if the stranger should have any views of engaging in agricultural operations, the prospect opening to him as he rides over the undulating surface of Malacca, through the rich grain fields and over the gently rising garden land, is one calculated to raise his enthusiasm, and to determine him on travelling no farther in quest of a location. This was fully exemplified in the case of the several gentlemen who visited Malacca last year, but whose subsequent settlement in the country has probably been interfered with by the late mercantile failures. Malacca has been 20 years in our possession, but it is believed that these gentlemen were the first that ever visited the interior, which has throughout continued a "terra incognita." It is to be hoped that they have broken the spell, and that their report will induce others to resort to such an admirable agricultural country, where,

as far as human judgment and foresight can penetrate, there is nought to impede and everything to insure success.

There is no description of tropical cultivation that does not afford every prospect of success to the agriculturist in Malacca. Of the capability of the land for sugar cultivation a high opinion has already been recorded by competent judges, and the patches of cane that may be seen here and there throughout the country sufficiently confirm that opinion. In the same manner, the coffee grown by the natives in various parts, for their own consumption, in very small quantities it is true, for they are no great consumers of the berry, affords ample proof of what would probably be the result of coffee cultivation on a more extended scale. Spices cannot but succeed admirably. They have succeeded in Penang and Singapore, while Malacca, so far from falling short in the adaptation of its land for this cultivation is probably superior to both. Cocoa-nut trees thrive most luxuriantly, not only on the sea face but to a far distance inland and this without what may be called cultivation, that is, the nut is planted and left to grow without further care or attention. Plantations of this kind may be pointed out where trees of 4 or 5 years are in bearing, offering to a small capitalist, who would really cultivate the tree, an almost certain profitable return after a few years. It is indeed surprising that nothing has yet been done in Malacca in the way of cocoanut planting on a large scale. Newbold gives a calculation for 7000 trees requiring an outlay of 9800 Rs. before yielding at the end of 7 years. He is probably too high in his estimate of expense, but I should say that a cultivated cocoanut estate would repay the whole expense incurred before the expiration of 7 years. A large estate of this kind requiring a steam mill to press out the oil would undoubtedly prove a most profitable undertaking.*

Yet with all these natural advantages, with immense tracts of rich and fertile land waiting only to be cleared and planted to yield a most bounteous produce, with a climate of noted salubrity and a country intersected by roads and rivers, Malacca to this day remains nearly as much unknown as the interior of an African settlement.

* So extremely profitable must a cocoanut plantation necessarily prove when the trees commence to yield produce, that the expense of cultivation is comparatively insignificant. There is the drawback of having to spend money during some years without any return, but when the return is made it is truly magnificent. Suppose a well cultivated cocoanut estate of 500 acres, kept in good order and well attended to from the very first, the outlay on such an estate before any returns be obtained from it, would probably be, including interest, about 15,000 Dollars. Say that

It may be that the former, and now historical fame of Malacca as a commercial emporium may have conduced to this ignorance of its agricultural resources; people who have ever heard or read of Malacca, have learnt only that she was once the great depot of the trade of the Eastern seas, that this trade has now completely abandoned her for the more favorable position of Singapore, and that consequently she must be what Singapore would become if the trade abandoned her for some more fovoured rival,—a useless island covered with jungle. They have no idea that beyond what may be seen from on board a ship in the roads, there extends a wide tract of rich and fertile land, available to any one who will undertake to cultivate it, with a large population of quiet, orderly (though perhaps not very industrious) peasantry, and with all the resources that can be looked for by an intending cultivator.

Tin.—Malacca and the adjacent Malayan states have always been famed for the quantity of Tin found in them, but it is only of late years that much has been found within what are now the limits of the British possessions. Some fortunate discoveries of rich localities have given an impetus to the mining speculations which now employ several thousands of Chinese and tend greatly to the prosperity of the place, but it is to be feared that such prosperity will prove but temporary, and that after a few years these workmen may be thrown out of employ by the exhaustion of the tin layers, which are superficial and of very unequal richness. The whole operation of what is called working a tin mine is pure speculation, gambling in fact, in which many have lost considerable sums of money whilst others are found realizing handsome fortunes. As before mentioned, the interior of Malacca is a succession of undulations—of low lands mostly turned into rice fields, separated by gently rising, what are called garden lands. These low lands, or valleys, have every appearance of being the beds of former, it may be anti-diluvian streams, leading into or from some mighty river. It is in these apparent beds of streams and in them only that the tin is found, all on one apparent level, but of course in some parts, at a greater depth

in the 7th year the trees commence to produce, and give but ten nuts each during that year, at 90 tree to an acre this will give 4½ Lacs of nuts, which at 8 Dollars a thousand would realize 3,600 Dollars. In the ensuing year, supposing the produce to be 30 nuts a tree, the sum realised would be 10,800 Dollars, and in the next year, that is the 9th year from the commencement of the estate (at 50 nuts per tree, a very low general average) the produce would be 18,000 Dollars, while all expenses would have been nearly cleared off by the produce of the two former years.

than in others from the present surface, giving rise to the impression that the whole must have been washed down from some mountainous tin locality in former ages, and deposited in these beds. That the deposit should be richer in some localities than in others may be accounted for by various supposititious circumstances. Throughout these apparent beds of streams, there are persons constantly engaged in the search for good localities to work. An excavation is made and the digging continued till the layer of tin be attained, when a judgment is formed partly by omens and partly by the appearance of the ore obtained, whether the locality would prove remunerating or otherwise. If the former idea prevail, then all the expense is incurred of preparing to excavate on a large scale, and after some weeks of labour in removing the supervening soil, the question is solved whether this expense is to be put down to profit or to loss. The description of the manner of working the tin mines in Banca and of the geological features of the tin districts in that island given in the Journal for July last, is applicable nearly word for word to Malacca, the only difference, probably, being that the working in Banca is less a matter of chance success than here.* In Malacca probably not more than half the workings undertaken repay the expense, and perhaps one half only of these prove remunerative more or less above the original expense, while to four or five only have the grand prizes as yet fallen, but these are indeed noble prizes well calculated to stimulate all the speculative energies of Chinamen in the lottery. Some of these workings are so rich as to give one very much the idea of shovelling out dollars from a wide excavation in the ground. It is almost wholly tin, the washing it undergoes probably not carrying off more than one-fifth of the mass. Throughout the settlement there are now about a couple of hundred of these tin workings in full operation, giving employment to some 6 or 7000 Chinese labourers, and the number is on the increase. The quantity of tin exported from Malacca during the year 1847 was 16,243 piculs, while during the past nine months of the present year, from January to the end of September, the quantity exported has been 17,257 piculs.† The revenue derived from tin is now becoming considerable, amounting during the present year to ten thousand dol-

* See Dr. Horsfield's *Report on the island of Banka*, ante, p. 398 &c. also *Sketch of the Physical Geography and Geology of the Malay Peninsula*, ante, p. 102–106.

† A considerable portion of the export however, consists of tin imported from the bordering petty Malay states.

lars. Tin is considered a produce of the land and as such is liable to the payment of a tenth to the lords of the soil. The right of levying this is sold annually by public auction and last sale realized the sum abovementioned, having been only 3,000 dollars the year previous.

All the neighbouring states are more or less rich in tin. The beds of ancient streams, if such they be, appear to intersect the Peninsula in all directions. Pérák and Kálántán yield large quantities of the ore and probably Johore would do the same, were the search and working duly encouraged there, but throughout the Malayan countries the insecurity of life and property is so great as to preclude anything like a full developement of their mineral or indeed any other resources.

Trade.—Fallen indeed is Malacca from her once high estate, when she not only attracted, but commanded the whole trade, such as then existed, of these Eastern Seas. Yet with all the affluence poured into her harbour, and the immense influence which the possession of such a stronghold must have accorded to the Portuguese, there must have been something radically wrong in their system of rule to have caused them to be so frequently attacked by the native powers in the Straits, and to be so often reduced to the last extremities. The Dutch as before observed, seem to have enjoyed a much more peaceable possession, but with both, and it would have been the same under any European government, the then prevalent system of a grasping monopoly tended of course to check the overwhelming advantages that would otherwise have attended on the sole and undisputed supremacy over these seas. About the middle and latter end of the last century, Malacca was still a place of great commercial importance, being the only European settlement in the Straits, and the sole depot for the produce of the Malayan states and islands, but towards the close of the century the establishment of Pinang drew off the trade to the northern end of the Straits, and thirty years afterwards the more favorable position of Singapore completed her commercial downfall. She is no longer a depot of trade, and her Imports are wholly confined to articles required for the consumption of the population. Returns of this, so called, trade continue to be published occasionally in conjunction with those of Singapore and Penang, but they seem to serve only to point the finger of ridicule or pity at the contrast, as if Malacca was still striving to obtain a share of the eastern trade and desired to magnify

her little drop in the eyes of the world, whereas she has long since given up all pretensions to such rivalry and would now rather hold up her head as an agricultural and mineral producing country. The last returns of Malacca trade exhibit for the year 1847-8:

Imports,.....	1,638,478
Exports,.....	1,591,429

The imports consisted chiefly of rice from Acheen and Singapore, with opium and piece goods from the latter place and tin from the adjacent Malayan states. The exports consist of tin and treasure to Singapore, opium and piece goods to the adjacent Malayan states.

But besides this small maritime trade, Malacca has a constant trading intercourse with all the surrounding petty Malayan states, of which no returns are furnished nor indeed would it be practicable to obtain them with any degree of correctness. She may be said to feed the people of these states, for it is from Malacca that their supplies of rice are chiefly obtained in barter for Tin, Gutta Percha and other inferior articles. They might with ease grow all the rice required for their own consumption and more too, but in the state of anarchy and disorder into which they have fallen, the cultivation of the land is not much attended to, and were the supplies from Malacca to fail, starvation would ensue among them. As it is, rice is extremely dear among them, and when a Malacca trader succeeds in conveying his cargo in safety and obtaining payment for it (which often consists more in promises than hard money) his profits are considerable.

Conclusion.—It has been already stated that in 1828 Mr. Fullarton, the then Governor of the Straits, contemplated making Malacca the capital of the Straits settlements. He gave his reasons for such a measure as follows:

"In the first place it is the ancient seat of European government, has been so for more than 200 years, as such it is known and respected by all the surrounding Malay states, of which indeed it is the capital. The salubrity of its climate has long been established. It is more centrically situated within two days sail of Singapore and four of Penang. In the way of supplies to troops &c. it commands infinitely greater resources than either of the others, particularly for Europeans, and is admirably calculated for the central station and depot for whatever force it may be determined to collect together for the defence of the whole. The fortifications are indeed destroyed, but in this respect it is only on the footing of the other

settlements. At Singapore none have yet been erected, and those at Penang are worse than useless. Supposing it advisable to establish one of the stations as a place of strength and depôt for troops and stores, the local position of Malacca is infinitely more favourable than either of the others. Being on the continent it commands an interior, and owing to the shoal water no ship can approach so as to bring its guns to bear on any works on shore. It possesses moreover what none of the others can be said to possess—an indigenous and attached population * * In a political point of view it is conveniently situated for maintaining such a degree of influence over all the Malay states as would prevent their falling under Siamese dominion, and it is besides near enough to the south end of the Straits, to watch the proceedings of the Netherlands Government" (the two Straits bugbears of those days.)

That there is much force in these arguments none can deny, but it has become so much a habit to decry Malacca and to pity the state of decay and wretchedness into which she is supposed to have fallen, that to suggest such arguments now a days, to propose for instance to remove the seat of government from prosperous Singapore to fallen Malacca, would excite but a smile of ridicule or contempt, but it may fairly be asked—suppose that amid the chances and changes of this world, some shifts of trade should occur rendering it no longer necessary to resort to Singapore. Suppose in fact, *that* to happen to Singapore which has already happened to Malacca, the entire withdrawel of her trade, what would then become of her? In a very few years she would be a perfect ruin, abandoned altogether perhaps, while Malacca under similar circumstances, notwithstanding the neglect and contumely which she has suffered, has, since the withdrawel of her trade, doubled her population and probably more than quintupled her agricultural produce. In 1828, according to Newbold, the population of Malacca was 34,000, the quantity of grain (paddy) reaped was estimated at 691,000 Gantangs and the quantity imported at about 4,500 Coyans. In 1848 the population was 60,000 and the import much the same as in 1828. Consequently the increase of production during these 20 years has been sufficient to support a population of 30,000 souls. It is not too much to assert that had Malacca met with a fair share of encouragement and attention she would long since have realized Mr. Fullarton's idea of rendering her the granary of the Straits, and in all probability the whole extent of her area would have been cover-

ed with rich tropical cultivation, rendering it desirable to negotiate with neighbouring states for an extension of territory. Such has been the result of enterprise in Province Wellesley, and such it would have been in Malacca, where the lands are superior in their adaptation to sugar cultivation, had the good fortune of the place and that of the speculators themselves brought them here. But it is not merely as an agricultural country that the settlement of Malacca is, or rather ought to be, so valuable to us. It must be, borne in mind that Malacca has the prestige of antiquity attached to her, that her well authenticated annals reach back several centuries, during which they record noble feats of arms both native and European, and a degree of commercial splendour and magnificence rivalling that of Tyre or Venice, that her very name is held in veneration by the Malays, who look to Malacca as the chief seat of their literature and the chief source of their laws and customs, and that such is the attachment of the Malay to all that is ancient either in name or family that the very word Malacca has a peculiarly attractive sound to him. The consequence is that not only what may be called the indigenous population, but the immigrants from the surrounding states look to Malacca as, in some measure, their mother country, and are far from considering themselves as strangers when settled in it. All these circumstances, combined with the undisputed paramount power of the British Government in these parts, tend to give an influence to the possession of Malacca which, judiciously exerted, ought to prove instrumental in the gradual improvement and civilization of the states of the Peninsula. It is to be feared however that either no efforts have been made towards so desirable an end as the amelioration of the condition of the people of the neighbouring states, or that those efforts have been misdirected, for it is an undoubted fact that the petty states immediately surrounding are all of them in a sad state of anarchy and disorder, without any settled government and enjoying no protection of either person or property. The chiefs, under whatever designation, are needy and rapacious, ready to sell themselves to any party that will purchase the use of their name and influence, and the people are wretchedly poor and enjoy no means of bettering their condition, for though the countries are as fertile as Malacca, and some, if not all of them, still more abounding in mineral products, yet such is the state of insecurity and lawlessness among them that but very little can be done to benefit by such resources. We have ourselves, in our wisdom, tended greatly

towards this result by an apparent exhibition of liberality. The Dutch, at least in the latter years of their rule, held these countries well in hand, and if they did not civilize much, at all events kept them quiet among themselves, and extracted from them no small sum by means of a strict monopoly of all the Tin procured in them, but we, from some unexplained cause, have adopted a diametrically opposite course. We have not only withdrawn from all interference of any kind with these countries, but we have given up to them, with the professed view of evincing our liberality and without a claim or demand being made for them, some of the richest mineral districts formerly part of Malacca Province, such for instance as Mount Ophir, formerly a portion of Malacca, where several hundreds of people were usefully employed in working the rich veins of tin and gold there met with, and where now, the few who are engaged in such work are in continual danger of being plundered and murdered by some petty chief or other, who may take it into his head to adopt that means of obtaining a little money, and may imagine himself strong enough to overcome resistance from the workers. The policy of such withdrawel from all interference with the neighbouring petty states is extremely doubtful. They are fast becoming little more than the receptacles of the lawless and evil disposed, whose sole means of livelihood will be plunder and robbing, obliging us, in the end, for the safety of our own people, to take possession of the country, the very object we sought to avoid by our withdrawel and subsequent exhibition of liberality. One very injurious effect of this refraining from the excercise of our influence and controul over the adjoining states, is the complete stoppage of the overland trade which once existed with Pahang and other states in the Gulph of Siam. Pahang itself may not be overwell governed, but it is generally believed that the present ruler of that country is something beyond the usual average of his class, and that the country is tolerably flourishing under his rule. A constant intimate overland intercourse between it and Malacca would surely tend, above all things, to assist the efforts of such a ruler if he should be really desirous of benefiting his country, and would as surely tend to check him, should he or his successors be inclined to overindulge in tyranny and oppression. But between Malacca on the Straits seas and Pahang on the Gulph, there lie two or three of those petty Malayan states from all interference with which we have withdrawn, and which, as before mentioned, being little better than a refuge for

idle and dissipated Malays, the intercourse between the two countries is entirely precluded. Pahang is well known to be rich in both tin and gold, and formerly most of the latter found its way overland to Malacca. At present, no doubt it is carried chiefly to Singapore, but during some portion of the year, the communication with Singapore is impeded by the monsoon, whereas overland to Malacca the communication would be open at all seasons, and not only with Pahang, but with other states on the Gulph of Siam. This however is a vision of prosperity for Malacca not likely to become a reality without the intervention of causes that cannot now be calculated upon.

MEMORANDA RESPECTING SUMATRAN COAL.*

By Lieut.-Col. Low, M.A.S. & C.M.R.A.S.

I was favored lately by the hon'ble the Governor (Lieut.-Colonel Butterworth C.B.) with specimens of a coal which had been given to Captain S. Congalton, of the H. C. armed Steamer Hooghly by the Sultan of Língá.

The Captain has obligingly written to me as follows: "I got the coal from the Sultan of Língá, who says, that any quantity of it can be procured in his country which lies up the Rittie river in Sumatra. This river is very shallow, and lies in 42' S. Lat. and 103° 30' E. Long. in the Straits of Durian. I have burned about ¾ of a ton of it in the Steamer. It burns very well with little or no smoke. But its greatest fault is that it breaks into small pieces and runs through the fire bars. It is light in comparison with English coal. I dont know what the streak is that looks much like rosin."

On examing the coal (but not chemically) I observe it to have the following appearances and properties:

It is the lightest coal en masse which I recollect to have ever seen. It is very frangible, and breaks off as easily, perhaps more easily, transversely than in the direction of the laminæ. The cross fracture is flat conchoidal. The appearance of the surface, shining resinous, and the streak is dark brown, although the coal in lump looks quite black. It yields readily to the knife. It has much of the *aspect* of cannel coal, but is less shining and compact, and will not admit of being shaped into ornaments, on account of its being too soft and friable. In all of the above particulars this coal differs considerably from the Tánjong Kátong and Pulo Tigá coal described in the 1st vol. of this Journal p. 146. I cannot perceive any trace of fossil matter in it. But the associated strata may possibly contain such; although no specimens of these have been obtained.

The laminæ of the coal are thin and are occasionally interspersed with thin seams of a transparent substance of a reddish yellow colour. There are also crystals of alumn more sparingly interspersed. In my specimens there are a few pieces of dark grey

* We noticed the discovery, and gave a short description and analysis, of this coal in August, 1847, see *Discovery of coal &c.* ante, vol. i. p. 153. Ed.

shale interspersed, and the fracture of the coal is occasionally shaly. The Sultan it seems gave no account of the width of the seam or of its dip. It seems to be an outcrop in the river. There is no appearance of wood fibre in this coal. But we should recollect that the Sultan would only produce the best specimens.

This coal does not ignite in the flame of a candle like the Tánjong Kátong, Tánjong Bumbong and Pulo Tigá coals, owing to its being less bituminous than these are, and it consequently takes a longer time to ignite in the fire than they do. When fairly ignited it burns rapidly with a whitish yellow flame, this last proceeding chiefly from the bitumen, for the coal itself, unless under great heat, continues almost black until the bitumen has been consumed.

The bitumen does not spurt out as in these other coals, but is gradually evolved over the whole surface. It burns without any particular smell of sulphur, and I cannot perceive any but faint traces of sulphuret of iron, although as will be noticed afterwards it contains iron in considerable quantity. It has from this deficiency of sulphur one advantage over these other coals, and thus also, it does not decrepitate while consuming.

The residuum, after being burned under the action of the bellows, was found by me to be a hard black substance, in grains, not coak, and consisting of iron (I suppose, a protoxide) and earthy matter, the coal losing by the combustion about two-thirds at least of its weight. This ferruginous matter is strongly attracted by the magnet, and it forms about one-fifth part perhaps of the residuum, which last is black and very hard. The piece of coal thus *burned* by me did not contain any of the transparent resinous looking substance before noticed.

This last substance looks, indeed, as Captain Congalton remarks, very like rosin, but I think it is amber. It is interspersed in small portions through the coal and it lies in larger layers betwixt the layers of the coal and conformably to it. In my specimens these layers do not exceed $\frac{1}{2}$ of an inch in width and they consist of numerous films of from one-sixteenth to one-eighth of an inch in thickness. They are brittle, and break into small irregular fragments approaching the rhomboidal. It is insoluble in water; when powdered and thrown on the fire it flashes like rosin.

I submitted this resinous looking substance to heat in contact with the air. It does not readily ignite in the flame of a candle, but when placed in an earthen vessel over a brisk fire it melted and then

gave out a resinous smell and much whitish yellow flame; when this had ceased an oily matter remained, and when this last had dried, the vessel was found to be coated with a scoriaceous looking pellicle of a metallic, bluish, and glistening appearance. When scraped off this was found to be some compound of iron which was attracted by the magnet. This resinous substance before being submitted to heat exhibited resinous electricity, a certain property of amber.

I am not aware of any other perfect resin being found in coal beds.

Amber is sometimes inclosed in jet, and it occurs in brown coal at Hasen Island in Greenland &c. The melite, a sort of resin apparently, occurs in bituminous wood.

THE VIRGIN DAUGHTER OF SULTAN BONGSU,

A DAYAK TALE, WITH A TRANSLATION.

Tikabar ka banua na, Sop adeu nan angapeut pekir Sultan Bongsu era baribatn. Adeu enteukn kapal nyeu buah, Nakhoda Malim Bongsu era minang anak S.B. Meus chukup taroh ano, misik nih ka na ka banua, misik anak S.B. " adeu, mak na di minang ? kamun mak, iko era nyudi," misik-a: " iko sa era, kamun sampai." Bakata nan nih mai ka penggawa ujar penggawa " bidikn iko sa bakata, laba beukeutn iko di empu-a, anak dinih; ani ani ujar no, ma: sakadar nyampai kata, jaji iko." Tikabar nan mai ka S. B. kata Nakhoda Sija na enteukn era minang. Bakata nan S.B. aman anak-a " hei anak," ujara " iko sa bulih kai bulih era nyampai kata na," " kata ani?" " ujar anak-a, nyaut ani beukeun-a?" " misik anak ko nan." " Asi mansia ujar a ?" " Nakhoda Malim Bongsu," ujar ma " ampat ratus nih era engeunteut." Má kah di ampat ratus, ampat ribu ga, kai ko narima. Era iko babeuneu, tapi ko minta burukn muri di panai macha hikayat, baruk di panai badikir, munsakn di panai bakichapi. Nih nan kata ko kabar ka Nakhoda Malim Bongsu," kaneuha nyampai nan maia ka Nakhoda. Ujar Nakhoda " Bait." Hilang charita Nakhoda, timul charita si Miskin. Si Miskin na agi angut; ensaya anak S.B. kunih: kabau kabau tangka romon nih engan anak S.B., anak S.B. kapala palar aman-a. Ensaya nih, mada balayar, kapala kasih nih aman-a. Hilang charita si miskin timul agi charita Nakhoda. Na bakarah mangkeutn prau era nyah balayar. Chukup ijo ano, na mangkeutn prau; prau-a pau jaji, lalu kana engulur ka pitu. Hilang agi charita Nakhoda, timul charita anak rajah ja. Na bapangkeutn pabakal ra nyah bakal na balayar; pabakal meus jaji galeus: Nakhoda pan bamuat ba ano ano nih barangkut; juada si kambang, nyah embakal Nakhoda: juada anak raja ja, nyah embakal si Miskin, meus galeus, laba kana engangkut. Angkut miriam nih agi miriam baginan " sapu rantau," " sapu jagat," kijang gila" " gantar tanah" pedang-a baginan si Rinchong Bandong. Poro baduweu nan nih balayar; enteukn ka nungeun, singah, engau page-a do rumin: poro baduwen enteukn ka nungeun. Engapeut page-a balayar nan nih maia. Balayar ijo ano ijo engarum, enteukn ka gunong basi, singah nih kunih. Miriama kana masang dibakar na ka gunong basi kanenha." Tinga

nangut ujar-a " Desah, palima hulubalang prau do hi penteunga sa ? " ujara prau Nakhoda Malim Bongsu, na era marbia." Miri dagakn nih kunih, meus miri laba, balayar agi, enteukn ka Gunong perak : singah ka, engalania, misik laba bait jet : enganung laba rarakn kai nih miri balayar agi nih do nih enteukn ka Gunong timaga, engkai nih singah, balayar ka nih laba enteukn ka Gunong amas singah nih kunih. " Ani ginan turutn desa," ujara " sa nan baginan Gunong amas" ujar na " prau era tok pi ?" " era marbia. Adeu, mak, na kusa bisi laba ?" " Laba ani ?" ujara. Bisi burukn muri ?" " mak" ujar na " chuh adeu, ka Gunong intan chuh." Sop balayar nan nih maia tok nih. Ijo ano ijo engarum nih balayar enteukn kunih. Kana masang miriam kaneuh a kunih sapu rantau sapu jagat, kijang gila, si gantar tanah. Bakar rajah na Gunong intan kaneuha. Pingatn mangkok ka pangah bapachah pachah ? orokn tanah bagarak. Nyam panglima nan rajah maia. Ay, palima ! ko mada bengkeupm engawas laba ka lah. Engani engani rata ba pachah pachah ? Entaji do apet ko sampai ka ko sa, kalak enganung tanah di jisah. Sop desa nan palima Sija maia engawasa : kana ninga, adeu nan. " Prau do pi peuteunga sa ?" ujara, " Prau do Ajakn Gala," ujar-a " na ra marbia." Balabuh nih maia kunih ; layar kaneuha endesah, sauh kana matatn. Engarum ano, sampe kaneuh rajah nyaru man nih ka rumin. Kai nih tuis kunih poro taroh engarum nan, lalu miri laba bait jet. Ani di kai kana miri ? Hilang charita Nakhoda, timul charita Si Miskin. " Inak ra batolak sa, Nakhoda ?" " Jaleupm," ujar-a. Sop sampe nih maia, Si Miskin matur Rajah. " Ani gawai enteukn sa, Miskin ? ujar a " Ay ulutn nyatu ampun tuah an ulutn mun burukn muri kudu sampian engalatak raga." " Ay ra, nyah na angut, ani nih ?" " Bidia, misik nan kudu patut raga." " Kai ko nyual burukn muri nih ; kusa kai bagawai : kun ra mit a sa, tubit." Sop kana mit nan kaneuh a, kana mit desah ka prau burukn muri, baruk, munsakn. " Ani kabar agi, Miskin, ujar Nakhoda ; ani gawai miri laba jinih ? Mak ga gawai a." Sop, nyawa ano, balayar nan nih maia. Ijo ano ijo engarum nih balayar enteukn ka Gunong Ledang, singah nih kunih, mamu. " Angat sa, Miskin," ujar Nakhoda, " bait mamu." Sop mamu nan nih maia. Nyina taitn mamu. Meus sampe nyina, Si Miskin agi desah. Si Miskin pan nyilam, nyina pan nikapm engan tombak. Si Miskin pan kubeus kunih, nyina pan balayar. Ijo ano, ijo engarum balayar do nih lalu enteukn ka banua, batambat prau a maia. Chukup taroh ano, sampe nan nih,

matur Sultan Bongsu "Sa mak gawai ko sa—si bulih bulih a ra gawai nan agi kupi Si Miskin? ujar S.B. "Mak Si Miskin" ujar Nakhoda "kubeus kanah lodan nakap," lalu barangkut nan nih maia. Bakata agi S.B. engan anak a "Hie anak, sa meus mak palang" ujar a era ko gawai, tapi peureu aitn buntatn nyeu teungeun, wai nyeu teungeun, wit nyeu teungeun; ta meus kana inan buah buntatn nih maka ko era nikah." Labuh nan nih maia gawai. Ba buratn buratn buratn, duweu buratn, taroh buratn masi mak buntan a timoh, sampai taroh sawa. Nyina pan mopuk omok. Hilang charita Nakhoda, timul charita Si Miskin. Si Miskin udip bau enteukn ka rumin Nek Kabayan kaneuh N. K. engkudip. Kutak, kutak, kutak ujar manok a bui bui ujar Nek Kabayan "Setan Abalis, ma ra myamak dio ko sa!" Sampe enteukn ka dio N. K. ujar nyina "du ra je ko kai ba seungkeutn tampa bah sungkeutn engkai baranak." Hilang charita dinih, timul charita anak Soltan Bongsu ja. Barai kah a enganung Si Miskin ninga Si Miskin kabeus. Man, kai man—mamu, kai mamu milang ano, milang ano. Timul agi charita Nek Kabayan Bajaja jaja kambang, jaja wit, galeus kaneuh na miri wit a, milang ano nih bajaja. Di angut Si Miskin ja mopuk ayu—bajaja agi apet aja maia. Sop nyina agi enteukn matur na bateuneuk nyah empara na, na mada miapm: laba labu a pachah. Meus labu a pachah, Si Miskin kana mangkong. Na mada bateuneuk; ninga nasi mantah, kana mangkong agi: sop, pulakn nih maia rumin Nek Kabayan. Timul agi charita ulutn Soltan Bongsu kana mada miri wit. Sop ninga di angut adeu kunih, pulakn nih, bakabar nih ka rajah "adeu ko ninga di angut ka dio Nek Kabayan." Sop kana mada engawas nih maia. Sop kaneuh a engawas adeu nan nih ka dio a. Sop kana engeunteut burukn muri nih kunih. Enteukn ka dio, kana enganah ka bas Si Miskin burukn musi kaneuh engangut nih, lalu ore maia. Burukn muri kaneuh a napok, ano pan engarum. Si Miskin bakata engan burunga ja. Kun banar burukn muri panai macha hikayat isa ko enganung. Sop bakata nan burukn muri "kuna ko ra bakata? ko masi kanah enganah kau kandang." Sop kaneuh a engalapas a maia; ano pan engarum. Burukn muri muka swara, di angut pan enteukn madai kunih enganung burukn muri macha hikayat. Sop, ditinga burukn muri, pulakn nan di angut dinih maia bakabar ka rajah. Sop kaneuh a engabar ka Tuan Putri Bandang Ayer. Sop kaneuh a mada no inanga engawas a kaneuh a nyaru no inang "Aye no inang," ujar a "nah! dau duit sa, ka mada miri wit palis ninga burukn mu-

ri. Sunguh kah embolah kah di meus kana manuah kaneuh di angut mino: kun sunguh, likas pulakn." Sop sunguh nan. Munsakn panai bakichapi; baruk panai badikir: burukn muri panai macha hikayat. Bakabar nan nih maià ka Tuan Putri Bandang Ayer. Kana manuah ka ma kaneuh tuan patri nih "kuna akal sa? rama aji ibu suri. Sa meus napeut ko amban barongan kasoma dewa. Ani kata ibu Suri rama agi engan kolah ano desa disingkeumeus ko kubeus, digantukn ko tingi, di jual ko joh, di reuneupm koh obah masa ko kapalang ano desa ko kai. Ujar Nakhoda Si Miskin kubeus kaneuh lodan nakap a—teh sa *adeu* nyina. Tandè Nakhoda jet ate-a. Nyabong Nakhoda engan ana raja, ba ano ano nih nyabong. Sop turut ka Si Miskin bungkas baju karonga. Hilang charita Si Miskin, timul charita Nakhoda. Nyina ra engeunteut bunga wai agi wang ampat ratus, buntatn ampat ratus, kambing ampat gnanan, baras 400, bawakn ampat picul. Buntatn di kana meureu pan meus babuah; wai a pan babuah, wit a pan bacharang. Hilang agi charita Nakhoda, timul charita tuan patri. Bakata tuan patri engan ibu suri "Aye, ibu suri," ujar a "ko ra engao Si Miskin ka dio a, tok chuh ko sa. burukn muri kah aitn dao. Sop kana engau kaneuh Si Lamat kana mi tok balai. "Aye burukn muri" ujar a awas ka enganung peuseutn ko sa. Kun na ka lamun adeu di mada macha hikayat ija, má era. Beukeutn dopada rajah Tunggal má era di parentah na: raja Tunggal ni anak Sultan Bongsu. Sop bakata nan rajah Tunggal maia "kun banar burukn muri sa pengkudip Si Miskin nan teh macha hikayat, ko ra enganung a." Sop kana nyurung koraan kabadap burukn muri. Sop kaneuh a macha nan: munsakn kana migatn kichapi: baru kana migatn ribana. Sop panai nan nih. Bakata nan nih engan rama agi, engan ibu suri. Ani adeu ka ko ujar ibu suri a? Ani ga ujar rajah Tunggal? kun brani rajah Tunggal engalabeh a sa, karna nih ago minta tuan patri, minta laba empatoh. Beukeutn misil, laba empatoh; empatoh lah ginan a. Samupus na basuweu babeuneu. Bukan wang saja nyah na minang mala lamar. Tuan patri sa babeukeutn beukeutn kabendak ate a. Kawin nan nih maia, nyimalih pachul nih maia. Na pan ba arak arak engan Si Miskin ka dio masang miriam batatalu, badil batatenggang penganten Si Miskin na anak susunan Si Miskin. Sampe nan penganten, lalu kana nikah kana engumpur jo-a jo-a Samantu alang ambang ambang di kwala jaga Nakhoda Malim Bongsu ampat emporo ampat kaudaha jo-a joa. Man na mai. Meus na man, joa jo-a agi man. Meus na man ore nih. Bakata

agi raja Tunggal " Aye, Nakhoda" ujar a " Sade ko meus engapeut amban barongan ko harap saja ka Naknoda. Maka Nakhoda jisa tikat engan Si Miskin. Balit Nakhoda (pinta pinta ateko kai jisa !) Te anakhoda jisa mangkeutn amba-rayit—pinta ateko má jinih. Kabuda umur na masi ra udip. Ko kureu kabaita. Sade ko meus engapeut lawan-a. Asal enga engasi Nakhoda, ikolah malawan do Sade ko. Maka paminta Sade ko minta burukn muri, dapeut nan kaneuh Si Miskin, ko engawin lah nih maia. Nan kagaleus pakata ko engan Nakhoda. Asal ra bamalu, sa lawan a. Entageutn dipanchong bawa maran, bakata nyeu lamur engkai Nakhoda karasa meus engkeumeus na, kata nyeu lamur ga kai. Bakata nih maia " kuna akal ko di kai bisi wang sa, ujar a. Pulakn ko sa," ujar a. Balayar nan nih maia.

The meaning of the story.

I have not the time to follow the above through for translation, nor is it worth the manual labor: I have given it for the language sake, though a deal of Malay is quite unnecessarily in it: it is, of course, a Malay story, dressed in a chawat. The outline is that the Sultan was desirous of a son-in-law, and the Nakhoda, hearing of it, came; and after spending three days in inquiry whether any wooer were on the spot, opened his proposals in form, offering400 of money to help his acceptability. The princess Bandang Ayer, however, had long. known and loved Si Miskin, and replied to her father (who had told her who had come, and what his errand) that neither 400 nor 4,000 would answer at present. " I am " said she " desirous of a husband, *but* I must first have, from him who would be such, a bird who can read" and a monkey and a musang of no little power to amuse. Of course the Nakhoda and Si Miskin had, each, now but one desire; but, rather oddly, we find the rivals going in the same vessel to the various mountains (i. e. the shore near them) whose names you have recognised. Si Miskin obtained the necessary gifts, and, when the Nakhoda saw them he spoke of their worthlessness, intending however, to own them himself at the earliest moment. " Hot weather, this," said he one day to the unsuspicious Miskin, " let us bathe," and the Nakhoda suited the action to the word; after a few plunges, seeing Miskin ready to follow, he left the water and, seizing a moment when M. put his head under water, stood prepared to kill him with a tombak as he rose. He did so, and finally came home with the bird &c. reporting Miskin

carried off by a " lodan." Years after, without a syllable of explanation or a " by your leave," Si Miskin re-appears, walking up to the house-front of Nek Kabayan : the plain, self-possessed expression is " udip bau," lived anew, and verbiage is avoided : the man was needed, and why a great parade in putting him to use! When the Nakhoda arrived at home, he left his bird, musang and monkey with the Virgin's father, and cocoanut trees were planted, among others ; when the first nuts should have been eaten from the trees then planted, the princess's pledge was to be redeemed. Meantime she neglected to eat or bathe, through grief for her " loved and lost". The Dyak idiom is " Man, kai man mamu, kai mamu," a sort of " quoad" being implied viz. " as to eating, she did not eat, &c. Nek Kabayan's house, which we just saw Miskin approaching, was a noted place for good sirih and accompaniments, and Sultan Bongsu was in the habit of sending to Nek for his daily supply. Judge of the excitement at the palace, and especially in the apartments of Bandang Ayer, when a servant came home, one morning, and was sure that he had seen the lover she was regarding as for ever gone ; it was no longer " mamu, kai mamu, " and appetite revived. The slave was at once sent back to look well again, and brought new joy with him, for no one might longer doubt. The bird was now sent to Nek Kabayan's house, and became proficient in reading under Si Miskin's care : the beasts also acquitted themselves with credit. Meantime the cocoanut trees were nearly ready to yield ripened fruit, and the Nakhoda was making great preparations for the wedding entertainment. Detail is unnecessary. Bandang Ayer married, with great pomp, the man of her heart, and, during the ceremonial 44 men were on guard at the kwala to prevent the irruption of the incensed Nakhoda, whose vessel was riding near. After it was quite completed, the brother of the bride, Rajah Tunggal, had a frank talk with the disappointed navigator in which such remarks were made that the heart of the murderer was as lead within him. He could not reply in any other words than these " What farther can I do, I who have no money? I shall go home." *Balayar nan nih maya.* And at once set sail.

ERRATA &c.

Page 727	line	18	*for*	Jakola	*read*	Gakola.
„	„	26	„	1649	„	1640,
728	„	5, 16	„	Payopayo	„	Paygopaygo.
„	„	25	„	Sinat	„	Surat.
„	„	29	„	Sinor	„	Ligor.
729	„	21	„	1505	„	1695.
738	„	9	*after* "interior" *add* "when the following report was made."			

THE

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THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

ON THE ALPHABETS OF THE INDIAN ARCHIPELAGO.

By John Crawfurd, Esq., F.R.S.

The use of letters has been immemorially known to all the more civilized nations of the Indian Archipelago, of the brown-complexioned, lank-haired race, and many alphabets, at once distinct from each other, and not borrowed from any foreign source, are to be found among them, from Sumatra to the west, to Celebes and the Philippines to the east.

Modern writers have supposed that the earliest writing was pictorial or hieroglyphic, and that in process of time, this became vocal or phonetic, ending in literal alphabets. Of the truth of this theory, however, no evidence is to be discovered in the insular languages. Hieroglyphic writing is no where to be seen on any ancient monuments,—the letters of the numerous alphabets which exist bear no resemblance to any object of nature, animate or inanimate,—the names of the letters simply express their sounds, and the word for an alphabet consists, as with ourselves, only of an enumeration of a few of the first letters in order of which they are composed.

The Javanese is certainly the most perfect alphabet of the Archipelago, and a brief account of it will give a general notion of the rest which, although they differ in form, bear it, in principle, a common resemblance. It has a distinct, and invariable character for every sound in the language, and so far, therefore, it is a perfect system. The consonants amount to 19, and I represent them in roman letters, as follow: b. c̄. d. ·d g. j. k. l. m. n. n̄. ñ. p. r. s. t. ·t.

w. y. Besides these there is the aspirate which always follows a vowel, and never aspirates a consonant. The vowels are 6 viz., a. á. e. i. o. u. The dipthongs are 2 viz. ai and au, but have no characters, being expressed only by their elements.

With the exception of an initial a, the vowels are not considered substantive letters, but viewed as mere orthographic marks, or as the Javanese express it "the clothing" of the letters, that is, of the consonants. The mark of the vowel á is placed over the consonant, of e before it, of i above and to the right of it, of o, which is a double one, part before and part after it, and of u under it.

The initial vowel a, standing alone has its own proper sound, but as just stated, it is considered a substantive letter, and when "clothed," as the Javanese express it, with the mark of any of the other vowels, it becomes such vowel, but as an initial letter only.* The application of the vowel marks to the consonants always implies that the vowel is annexed to, and never that it precedes the consonant.

Every consonant is a syllable, in which the vowel a. annexed, is understood, and thus far the Javanese alphabet is syllabic, a character common to it with all the alphabets of the Archipelago. There must, of course, be some contrivance for eliding the vowels, and this is rather of a cumbrous nature. At the end of a word it is done, by an appropriate orthographic character, but in the middle of one it is effected by a set of new consonant characters, two of which are in the same parrallel with the proper consonants and the rest placed below them. The presence of these indicates that no vowel precedes them. The letters ṅ, r and the aspirate which I express by the roman letter h, when at the end of a word or syllable preceded by a vowel, have distinct and appropriate characters.

The liquids of the Javanese language are b. r. w. and y., and these alone coalesce with other consonants. The letter r, when doing so, having a peculiar character for the purpose, with another when following a vowel and closing a syllable. In all, no fewer than 50 characters, including indispensible orthographic marks, are necessary towards writing this language, independent of 8 capital letters, and some syllabic abbreviations, forming a system very com-

* The initial a, it is to be remarked, has been mistaken by European writers for a mild aspirate, and expressed, consequently, by the letter h. I fell into this error myself, and I find that Messrs Roorda and de Groot in their excellent grammar and vocabulary of the Javanese have done the same thing. We owe the correction of this mistake, and the true meaning, first to Col. Lowe and after him to Baron William Humboldt.

plete for its purpose, but rather complex. To these again, must be added the ten digits or numeral characters which, from the resemblance of some of them to the letters of the alphabet, and their existence on monuments at least 700 years old, are most probably of native invention like the alphabet itself.

The Javanese alphabet, like all the others of the Archipelago, is written from left to right. Each letter is distinct and unconnected, and the writing is perpendicular, and not slanting. The letters have an oval, rather than a round or square shape, and each is formed, not by several strokes of the pen, but by a single effort. On the whole, they are so well formed that a carefully written manuscript, if not handsome or showy, has at least a neat appearance.

The Javanese alphabet, although always exhibited in the same order, has no vocal classification. The dental and palatal d, for example, are separated by 5 other letters that have no organic connexion with them, and the dental and palatal t by 11 equally unconnected. The letter a begins, and ṅ ends it. The first four latters are a. n. c. r. k. which pronounced with the inherent a, form the word anacaraka, the name of the alphabet, or in other words the a. b. c. of the Javanese.

In the character thus described are written,—the proper Javanese, the Sunda, the Bali, and occasionally I believe the Lombok. The Sunda, and Bali, alphabets, however, want the palatals ·d. and ·t. Altogether, including Palembang in Sumatra, it is probable that the Javanese alphabet is current among no less a population than twelve millions.

This, however, is not the only alphabet that has been known to the Javanese. In the work of Sir Stamford Raffles there are excellent representations of not less than twelve different characters found on ancient monuments of stone or brass. One of these forms is Dewanagri, such according to Sir Charles Wilkins, as was current on the continent of India about nine centuries ago. A second character is nearly identical with the old square Pali, and eight are but ancient forms of modern Javanese writing. There is at least one example of a character distinct from the modern Javanese, and from all of these found in the western parts of the Island, and we may safely conclude therefore, that the inhabitants of Java have invented two alphabets.

In Sumatra, beginning from the west, the first evidence we have of a native written character is found among the Bataks, and it is

singular enough that a nation of cannibals should possess the knowledge of letters. There was assuredly nothing of the kind in Europe, or Continental Asia, until long after men had ceased to eat each other.

The substantive characters of the Batak alphabet are the same as those of the Javanese, with the exception of the letter c and the palatals d and t which it wants. Among these are not only reckoned a, as in Javanese, but also i and u, so that the whole number including the aspirate, which is reckoned among them, is no less than 20. But the real number of the consonants, omitting the aspirate, is but 16.

The vowel marks are only four representing e. i. o. and u. They are used with the consonants as in the Javanese alphabet, but they are not as in that, applied to the vowel a nor to the others included among the substantive letters.* As in Javanese, every consonant is a syllable ending in the inherent a, but I can discover no other contrivance for eliding this vowel, except its supercession by the application of a vowel mark.† If this be the case, every word or syllable must begin, either with a consonant, or one of the three vowels a. e. i. or u, and end in a vowel or the nasal ù for which the alphabet has a peculiar mark.

The Batak alphabet does not, like some others of the Archipelago, follow the organic classification of the Hindu alphabets, but it is not, in this respect, wholly arbitrary, like that of Java, for it has a peculiar arrangement of its own. It begins with the vowel a, and ends with i, and u. The aspirate immediately follows the letter a. Then come in succession two dentals d and t, two liquids r and l, three labials b. p. and w, two palatals y. and j. and then the sibilant s. ‡

Mr. Marsden would appear to think that the existence of the metrical arrangement of the Sanskrit alphabet was at one time general over all the alphabets of the Archipelago, and although he admits the difficulty of proving any filiation, considers that all of them were taken from the Hindus. But as there is no resemblance between

* The accents are used with all the letters except ◌ᩥ i and ◌ᩩ ú. (Willer, Tijd. v. N. I. viii p. 390.)—ED.

† The *pengolet* ᩴ performs the office of suppressing the a. (Willer, *ubi sup.*)—ED.

‡ It is so in the arrangement given by Marsden (Hist. Sum. p. 202) but he adds that "it does not appear that any determinate order is observed in the arrangement of the alphabet, which is found to vary more or less in every specimen." Mr. Willer's arrangement differs from Marsden's.—ED.

the Malayan and Indian letters, and as the Hindu is but partial, it is surely more reasonable to conclude, that the alphabets are distinct, and the partial metrical arrangement is but an accidental modification.

The form of the Batak letters is generally horizontal, the body of each letter being always so, and the vertical or the diagonal strokes to distinguish one letter from another, being, as it were, only supplemental. The letter p. for example, is a simple horizontal stroke thus —. The vowel i. consists of three horizontal strokes diminishing downwards thus, ⩧ while u. consists of three diminishing upwards thus ⩦. The aspirate consists of a horizontal dash with two small vertical strokes. The writing in fact seems to consist of a few simple scratches or hair strokes.* In this there is no discoverable likeness of any object in nature, animate or inanimate,—nothing whatever to indicate, that vocalic writing has been immediately derived from pictorial. "In their form" says Mr. Marsden "the characters do not even partially resemble those of any other alphabet."

The next alphabet we meet with, proceeding eastward, is the Korinchi, found in the country of the same name which borders on Menangkabau, the parent country of the Malay nation. I have never seen any other specimen of this alphabet than that given by Mr. Marsden, nor had he himself seen any other example than the original from which it was taken. It is unsatisfactory, nor does the description agree with the plate. The number of characters given in the latter is 29, but the description marks the vowels a. i. o. and u. substantive letters, while the first of these only, is found among them. Among the characters in the plate there are two for the letter a, two for the aspirate, two for k, two for ṅ, while there are five characters expressing sounds represented by Mr. Marsden by the double letters nd. ns. nc̃. mp. and nt. These last are, most probably, syllabic and not literal characters.

In the Korinchi alphabet we find no dental d, and no palatal ·d or ·t. The vowel marks, the *sanjata* or armour, as the Malays call them, are, in reality only two, viz. for i and u, the first designated by a simple point after and above the consonant, and the last by one below it. The vowel a, as in all the other alphabets, is inherent in every consonant, and there is no other means of eliding it except its supercession by the application of the vowel marks. A

* These strokes, however, are generally curved, and not straight as in Marsden's copy.—ED.

single point over a consonant expresses the nasal ṅ following the vowel a inherent, or a consonant qualified by another vowel mark, two points express an aspirate following a vowel at the end of a word or syllable.

In the Korinchi alphabet, there is no attempt at arrangement or classification. It begins with t and ends with r; labials, palatals, nasals and gutturals, being jumbled together in thorough disorder.

The letters are formed by straight scratches, generally more vertical than those of the Batak, but in some instances also horizontal. It differs wholly from the latter. Thus a horizontal stroke in the Batak is the representative of p. and in the Korinchi of t. Three strokes declining downwards in the Batak represent the vowel i, but in the Korinchi the compound character ns. On the whole the Korinchi alphabet must be pronounced a very rude one.

We come next to the Rejang, the alphabet of Lemba and Pasummah on the western side of Sumatra. This consists of 23 substantive characters. Among these are included the aspirate and the vowel a. with four which are apparently syllabic compounds. The actual number of consonants, excluding the aspirate, is but 17, the palatal ·d and ·t of the Javanese being wanting. Looking at the alphabet, however, the number of written characters is found to be 32, which arises from some of them being in duplicate and triplicate forms.

The vowel a is, as usual, inherent in every consonant. This is rendered mute by an express orthographic mark as in Javanese, called mati or "death." The vowel marks are five in number viz., e., i. and u. with the dipthongs ai and au. The vowel o would seem not to belong to the language.

In this alphabet, we have the first example of a classification of the consonants after the Hindu model. It begins, like the Dewanagri, with the gutturals, accompanied by a corresponding nasal. The dentals and the palatals follow successively. Then comes the single sibilant ef the language, and the last class consists of the liquids n. l. w. and y. The last letter of the alphabet is the substantive vowel a.

Eight letters of the Rejang alphabet, or at least some one form of them out of two or more, correspond with those of the Korinchi, so that it is certain, for the identity is generally complete, that the one nation must have borrowed from the other. Four and twenty of the Rejang substantive letters will still remain distinct, quite sufficient to prove it a distinct, and most probably an original alphabet.

The Rejang letters are formed of upright scratches, or strokes, but not as in the Batak and Korinchi also of horizontal ones. As examples n is a rudely formed Roman M, and y is a double u W. Upon the whole the Rejang alphabet is more complete than either the Batak or Korinchi.

The Lampung nation, which occupies that portion of the south western side of Sumatra which lies opposite to Java, divided from it only by the Straits of Sunda, has its own peculiar alphabet, which consists of 19 substantive letters, the vowel a and the aspirate being included among them. The consonants correspond in power, exactly with the Javanese, the palatals ·d. and ·t. excepted, which the Lampung does not contain.

Every consonant includes, as in the other alphabets, the inherent vowel a. There is a peculiar character for rendering it mute, analogous in power, but not in form, to that of the Javanese. The vowel marks are 6 in number, namely for e. i. o. u. and the diphthongs ai and au.

Although the actual number of substantive characters expressing distinct sounds be but 19, the number presented in the scheme of the alphabet is no fewer than 44. This arises from several consonants having more than one representative, some two, some three and some even four. In examining this numerous list, two of them will be found common to the Korinchi and Rejang, and five common to the Rejang.

The Lampung, like the Rejang, has the Hindu classification, but it is not so correctly followed, the vowel a and the sibilant, are found out of place, and thrust in among the liquids.

The Lampung letters have a good deal of that angular, linear and meagre form which I have described as characterizing the other Sumatran alphabets, but certainly much less. About one third of them are well rounded, formed by a single effort of the pen or style, exhibiting some of the superior skill displayed in the formation of the Javanese letters, but from which, however, they are very distinct.

Two of the languages of Sumatra, the Achin and Malay, have no native alphabet, but are written in the Arabic character with some indispensible supplemental letters. This has been owing to the conversion of those who speak them to the Mahomedan religion, which had its beginning in the commencement of the 13th century. When we see ruder nations in possession of their peculiar alphabets, it is not likely that these more civilized ones should be without

them, but we certainly possess, at present no clear or certain vestige of their having actually existed.

On the opposing surfaces of an unhewn nodule of sand stone, where it had been split, there was in Singapore, a very rude but long inscription in an unknown character. The only people who are known to have occupied Singapore for any length of time are the Malays, who after emigrating from Sumatra settled here and made it the seat of their government for near a century, and this before their conversion to the Mahometan religion. It seems not improbable, then, that the inscription in question was in their native character, most likely in some antique form of it, as is the case with the monuments of Java, and of Birma in which the modern letters are never seen. It might indeed, be suspected that the inscription was the work of the Javanese who are known to have expelled the Malays, but the rudeness of the monument, so unlike every thing in Java, makes such a supposition very improbable.

In his journey to Menangkabou Sir Stamford Raffles discovered three different inscriptions, the characters on which he considered to be identical with those of the majority of inscriptions in Java, that is, that they consisted of ancient Javanese writing. As Sir Stamford, however, was unacquainted either with the ancient or modern Javanese, and had, at the moment, no able assistance as he constantly had in Java, his conclusion must be considered doubtful, and the writing may on further examination turn out to be the ancient writing of the Malays, the people in the heart of whose country the inscriptions were found.

After quitting Sumatra and Java proceeding eastward, the first example of a native alphabet we meet with occurs in Sumbawa, which is ascribed to the nation called Bimá. This character is no longer in use, but has been long obsolete, having been superceded by the current alphabet of Celebes.

Sir Stamford Raffles work contains a good engraving of this old alphabet, but unfortunately without the vowel points, or any other explanation except the naked description of the letters. Including the vowel, a, and aspirate, it contains no fewer than 32 characters. Nine of these are aspirates of other consonants, one the palatal ·d, known only besides to the Javanese, and two repreaent the letters f and z which are unknown to any other native alphabet of the Archipelago. Thus, as far as consonants are concerned it is far more copious than any of the other native systems.

The Bima alphabet does not possess the Hindu classification. Even the aspirated consonants are not generally placed in juxtaposition with the unaspirated. The letters seem boldly formed, and are not mere scratches like those of the Sumatran alphabets. As examples, the aspirated d, y, and the simple aspirate are represented by characters which respectively much resemble a large g, k, and h in ordinary European hand-writing.

Celebes appears to have produced two distinct alphabets, the one at present in use over the whole island, and which has extended to Bouton and Sumbawa, or wherever else indeed the Bugis nation has settled or colonized.

The modern Bugis alphabet consists of 23 substantive characters. One of these is the vowel a, another the aspirate, and the third a compound letter. The palatal ·d and ·t of the Javanese are wanting, and it has not the letter y, possessed by all the western alphabets. It is classed after the Hindu manner, into gutturals, labials, palatals, liquids, and a sibilant, each of the three first classes with its corresponding nasal. But each of these first classes has added to it after the nasal, a letter which appears to be an aspirate of the first letter in the order of each series. Thus the consonants are made to amount to 20 in number.

As usual, the final a is inherent in every consonant, and also in the aspirate. The vowel marks are 4, viz., for e. i. o. and u. These are applied to the consonants and aspirate in the ordinary manner, and also to the letter a as in Javanese. These is no sign of elision, for as a general rule, every word and syllable in this language ought to terminate either in a vowel or the nasal ŋ for which there is an orthographic mark. There are, however, some exceptions to this rule. Consonants are made to follow other consonants without the intervention of a vowel, or to end words as aspirates, when they are not expressed in writing. Thus the word makunrai, a woman, is written makuri and the n is left to be understood, and linroh the forehead, is written liro, the n being understood, as well as the aspirate, for which, except as a substantive letter, when it would have an inherent a, there is no character. All this shows that the Bugis alphabet is imperfect, and for fulness and precision not comparable to the Javanese.

In form, the body of the Bugis characters consists, for the most part, of small segments of circles running horizontally, the letters being distinguished from each other, by small processes, by being

double or single, by being inverted or supine, or by one or more dots over them. It may safely be said that the Bugis letters bear no resemblance to those of Sumatra, of Java, or even to the obsolete alphabet of Sumbawa.

Sir Stamford Raffles has given an engraving of another alphabet of Celebes, said to be found in old manuscripts. It consists of 18 characters, the vowel a being one, and the rest consonants, not including the aspirate which is wanting, as well as the three aspirated consonants of the current alphabet. It has the classification of the Dewanagri, and in point of form differs wholly, not only from the alphabet in use, but from every other of the Archipelago.

The last alphabet of the Archipelago is the Phillippine, that of the Tagala nation of the great island of Luçon or Luconia, the only one existing in the whole of this great group, but which seems, at one time, to have been used among all the civilized tribes of the neighbouring islands, having spread even to Magindanau and Sulus. The Philippine alphabet is more meagre than that of the western nations of the Archipelago, and consists of no more than 15 substantive letters, including the vowel a and the aspirates,—consequently of no more than 13 consonants. The letters c. j, ñ. and w, universal in the languages of the west, are wanting in it, not to say the palatals ·d and ·t of the Javanese.

The vowel characters are three, expressing, e. i. and o or u. The vowel a is inherent in every consonant, and the vowel marks have the same application to substantive letters, vowel a included, as in Javanese. The form of the letters is rather bold, and more complex than that of Sumatran alphabets. The consonant y is represented by a character which resembles an Italic *V.* and m and p have the same form, with a small distinctive process. It has adopted, but more imperfectly than those of Celebes and Sumatra, the Hindu classification.

We have then, in all throughout the Archipelago, no fewer than nine distinct alphabets, every one of which appears to be a separate and a native invention. But they are not only distinct from each other ; they differ equally from all foreign alphabets.

Some, indeed, have fancied that the Malayan alphabets may have been borrowed from the Hindus, but there is assuredly no solid ground for such an hypothesis. Some improvements in details, there is no doubt, they did receive from this source, but on examination, they are not found to be essential. The most striking of them is

the organic and rhythmical classification. But two of the alphabets of Sumatra, the obsolete alphabet of Sumbawa, and the Javanese alphabet have not adopted this arrangement. The last of these is the most remarkable instance, for it was the one of all the characters of the Archipelago most amenable to Hindu influence, as is sufficiently attested by the greater number of Sanskrit words in the language of Java, and by the existence in that island of numerous Hindu monuments, including inscriptions in the Dewanagri, side by side with those in the ancient native writing.

Some minor details many also have been borrowed from the Hindus, as the mark for eliding a vowel, the point over the consonants to express a nasal following a vowel and closing a syllable, the visarga or mark of aspiration after a vowel, and, possibly, the mark for the vowel u. These, however, are by no means common to all the alphabets of the Archipelago. I do not consider the a inherent in every consonant to be taken from the Hindus, although it be common to their alphabets. It seems to be simply a rude and inperfect manner of signifying all the vowels, before the discovery of marks for the vowels of less frequent occurrence, when it was appropriated to the principal vowel, a.

In fact, the main characteristic of the Malayan letters, their differing among themselves, and then differing equally from all foreign letters, leads to the inevitable conclusion, that each alphabet was a separate and independent invention, made, in all likelihood, in the localities in which we at present find them. If this be the case, the kind of fertility of invention which the fact evinces is a curious contrast to the utter absence of it in rude and early Europe, which never invented an alphabet, although in substantial civilization, it is not to be imagined that the natives of Java and Sumatra two thousand years ago were superior to the energetic inhabitants of Germany, Gaul and Briton.

What causes conduced to this early invention of letters among Malayan nations, and at so many different and distant points, it is not very easy to say. It is certain that the discoveries must have been preceded by a very considerable advancement in civilization, such as would afford leisure to some class of men to attend to such things. That class was unquestionably a priesthood of some kind, and the first and earliest use of letters would assuredly be, not for the common conveniencies of life, or even for its amusement, as in a more advanced stage, but for the sheer purpose of conjuration or incantation.

The developement of a civilization in which the invention of letters would spring up, would require that the natural circumstances of a country should be favourable. The territory must be sufficiently large, and sufficiently fertile and easy of cultivation, to produce a population numerous enough for its own defence, and therefore, to afford sufficient leisure to any class of its inhabitants. No respectable amount of civilization has ever risen, and no letters have ever been invented, in any country of the Archipelago destitute of these advantages.

The nine alphabets of the Archipelago are the prodcce of five large islands only, out of the innumerable ones which compose it. The most fertile and civilized island, Java, has produced the most perfect alphabet, and that which has acquired the widest diffusion. The entire great group of the Philippines has produced, and that in its greatest and most fertile island only, a single alphabet; even this one is less perfect than the alphabets of the western nations, in proportion as the Phillippine islanders, when first seen by Europeans, were in a lower state of civilization than the nations of the west of the Archipelago.

The Malayan Peninsula and Borneo, extensive as they are, have never given rise to an indigenous civilization, sufficient to raise their inhabitants beyond the condition of small and miserable communities, and hence no indigenous alphabet can be traced to them. Their more civilized inhabitants are invariably stranger emigrants. This must be owing to the absence of a certain kind of fertility in the land available to the rude and feeble efforts of a native industry, such as elsewhere gave rise to a concentrated population, to leisure and to letters.

No kind of native writing can be traced to the Spice Islands which, notwithstanding their rich native productions, are incapable of yielding corn, iron, or cattle, the rough staples of early civilization, and without the presence of which, letters have never been invented or existed. In the great island of New Guinea, with its savage negro population, and with the same deficiencies, the presence of any kind of writing is not reasonably to be looked for.

No trace of a written character has been found in the wide extent of the Islands of the Pacific. Most of them are, probably, too small to have furnished a population, at once sufficiently numerous and concentrated, to generate the amount of civilization requisite for the purpose. In the great islands of New Zealand, with their

comparatively energetic race of inhabitants, the discovery of letters would, most probably, have been made, as among some rude nations of Sumatra, had the civilization necessary not been precluded by the absence, as in the smaller islands, of the larger animals for labour, and of all the cereal grasses for food.

The facility with which materials to write on are obtained in the countries occupied by the Malayan nations has, probably, contributed something towards the early discovery of the art of writing. The want of them, on the contrary, is known to have proved a great obstacle to the progress of letters, and probably was to their invention in temperate regions. The absence of a good material in ancient Europe hindered the invention of printing, and its presence in China, no doubt contributed largely to its early discovery in that country.

The Indian islanders write on palm leaves, which have received no other preparation than that of being dried, and cut in slips,—on the inner bark of trees, a little polished only by rubbing,—on slips of the bamboo cane, simply freed from its epidermis, and on stone, metal, and finally on paper.

The palm leaf employed is that of the lontar, or borassus flabelliformis. The Malay word is most likely a corruption of two words, ron, a leaf in Javanese, and tal, the proper name of this palm in Sanskrit. This seems corroborated by the Javanese name, which is written rontal. From the use of this word, it might, at first sight, be imagined that the practice of writing on palm leaves was derived from the Hindus. But it happens that this word, with many others wholly or partly Sanskrit, belongs to the ceremonial and factitious dialect of the Javanese language, a genuine native name kropyak, existing for it, in the ordinary one, so that no safe conclusion can be drawn from this etymology.

The instrument for writing with on the palm leaf, bark, and the bamboo is an iron style, and their writing is, in fact, a rude engraving, which is rendered legible by rubbing powdered charcoal over the surface which falls into the grooves, and is swept off the smooth surface.

The Javanese alone understand the manufacture of a kind of paper. This is evidently a native art, and not borrowed from strangers, as is plain from the material, the process, and the name. The plant, in the Javanese language, is called gluga, Brouponotia papyrifera, and the article itself dáluwañ changed into dálamañ for

the polite language. The process is not the ingenious one of China, India, Persia and Europe, but greatly resembles that of making the Egyptian papyrus, and still more closely the preparation of the South-Sea cloth, the raw material being, indeed, exactly the same. The true bark, cut in slips, is long macerated and beaten, and after being thus treated, slips of it are joined to each other over a smooth surface, and defects made good by patching. The fabrick thus obtained is of a brownish grey colour, unequal in its texture, rigid, but strong.

With the exception of the Javanese, it does not seem that the natives of the Archipelago ever wrote with ink, before they were instructed by the Arabs, no doubt from the absence of paper. The Javanese have a native name for "pen" and "ink," suä and mañsi, but with the other nations, the only ones are Arabic,—kâlâm and dăwat, often indeed greatly disfigured, as in the example of the Bugis who convert them into kalah and dawak. The pen generally used is not reed as on the continent of Asia or a quill as in Europe, but a stub obtained from the Aren palm, Saguerus saccharifera.

Even paper is generally known to the Indian islanders by the Arabian name of kartas, so that it is probable that a true paper was imported long before the arrival of Europeans, although the natives were never taught the art of preparing it. At present European paper is in general use by all the more civilized nations, to the exclusion of Asiatic.

REPORT ON THE ISLAND OF BANKA.

By Thomas Horsfield, Esq. M.D.

MINERALOGICAL DESCRIPTION OF THE ISLAND.

(Continued from p. 725.)

In the geographical description of Bánká the extent and form of the western division has already been pointed out: it comprises, besides the western extremity, a large portion of the body of the island stretching to its eastern shore. My tour across the island was through these parts. Between Kutto-waringin and Belo an extensive tract intervenes which is desert and almost inaccessible. Except the northern parts of the district of Támpeláng which extend towards the hill Pándán, the country is alluvial and only pervaded by several ranges of rocks, probably of the secondary kind, which are noticed near Támpeláng, and at the points Tádá and Sukál it transmits the rivers of Dshering and Sukál; the former is one of the largest of the Island.

The *mountain Mánumbing* which with its two appendages gives a base to the western peninsula, is the most considerable of these parts.

Its declivities in the south extend towards the shore, either terminating abruptly or leaving a narrow plain near the confines of the sea. It agrees, upon the whole, in its form with the other mountains of Bánká, but resembles particularly the Pári-pári and Penyabung of the northern parts and the Permissáng and Páding of the great south-east-division.

This mountain is a long extended spine or ridge gradually rising to a blunt summit, whose highest point is elevated 967 feet above the level of the ocean, according to a trigonometrical operation of Lieut. Hanson. Its direction is almost strictly from west to east; this shows itself in the direction of the western peninsula. The Mánumbing consists of a central, more elevated portion, and of a western and eastern appendage; the former is called by the natives *Duláng pitsha*, the latter Gunong *Kukus*.

The *Duláng-Pitsha* from its junction with the large mountain extends about one mile with a nearly regular horizontal spine to the west; it then divides into several rounded peaks more elevated than

the rest, and finally runs off to the extremity of the island, forming the different points and promontories which have been noted on the map. In the east several low rounded hills intervene between the Mánumbing and the *Kukus*, which from its pyramidal form has probably obtained this name by the natives, as it resembles the pointed basket commonly used in boiling rice. From the central mountain and from appendages low ranges descend in every direction: the constitution of those which I examined in the environs of Minto will be described after some remarks on the large mountain. The foot of the hill Kukus stretches eastward to unite with the long range of low hills which pervades the central parts of the Island.

After remarking the constitution of many of the less considerable hills of the island, in the vicinity of the mines, I was anxious, on my return to Minto, to examine the Mánumbing, whose promontories I had already observed near the mines of Rángám, as well as different ranges of rocks which descend from its declivities to the sea. In ascending this mountain the natives follow two different roads; one takes a direction through the settlement of Dárát-lámá, and leads towards the Dulang-pitshá; the other strikes off to the eastward and approaches the hill Kukus,—I followed the latter. Beyond the new establishment at Minto the ascent is very gradual: about 2 miles from the shore I observed granite rocks on the surface: they are first dispersed singly; but their number increases on approaching the mountain. I noticed several of very large size and regular tabular sides, rising perpendicularly above 30 feet: many are low and rounded on the surface. In the component parts they resemble the granite found in other parts of the Island; the felspar enters in very large proportion and the mica is very sparingly distributed. Some masses contain large quantities of schorl in small laminæ or crystals collected together in irregular groups.

The road leads to the junction of the large mountain with its eastern appendage: I observed the gunong Kukus and the rounded hill above mentioned in various spots covered with large separate rocks. In the river Sungie Páit, which rises from the acclivities of the mountain, I observed a number of siliceous fragments; these were portions of decomposed granite rocks, and resembled the siliceous stones usually found at the aqueducts of the mines. Many of the granite rocks of this tract are very loose in their texture, and component parts readily separate on the application of a small force. Beyond the river Sungie Páit the ascent becomes more con-

siderable, and the road follows an excavation formed by the descending current, the sides of which consist of granite rocks.

The highest point to which any path can be traced is the connection of the large hill with its appendage: through this the inhabitants of Minto occasionally descend to the settlement at Kadur on the north side of the hill. Those natives who visit the Mánumbing for collecting rattans and various economical and medicinal plants which it produces, are obliged to enter the wilds at random.

I ascended a small distance in a western direction towards the summit: this part of the mountain is composed entirely of granite, the rocks are mostly large and precipitous, but in the intermediate spaces deep vegetable mould has accumulated and the greatest part is covered with profuse vegetation. The only peculiarity which I noticed in these rocks is an abundance of schorl collected in groups and often shewing itself on the surface. It appeared in slender, very long, needle-shaped crystals: detached fragments are sometimes found; several of these had been carried to Minto by the natives, where they were, on account of their colour and resemblance, produced to me as petrified coal.

Many absurd notions are entertained by the natives as to this mountain: the stories of persons who have accidentally been bewildered near the summit have caused a general dread to approach it. I remarked that the persons who accompanied me were unwilling to proceed beyond a small distance from the usual path.

Between the elevated parts of the Manumbing and its appendages which are exclusively primitive, and the lower ridges which bound the sea, a tract intervenes which is stratified and has the same constitution as the mining districts in other parts of the island. This tract surrounds the whole mountain as a belt of unequal breadth: commencing in the east, at the extremity of the hill Kukus, it contains the mines of Belo, which at their first opening and for many successive years furnished a very large supply of metal, these are at present exhausted and the miners have removed to the strata on the north side of the mountain: proceeding westward, follow the mines of Rángám and next those of Sungie Teluk Robiyá, Sungie Bábi and Sungie Deyng near the settlement at Minto. The tract now winds round the western extremity of the hill Duláng-pitshá and, inclosing the environs of Mendsheláng, Reáng Beát and Andshel, takes an eastern direction and follows the confines of the mountain in the north to its termination. This part contains the mines

of Kádur, Páit-dulang and Meng-gelám and probably stretches in a northern direction to the mines of the district of Pálángás.

This stratified tract is bounded by a range of hills which is alluvial in the south. I traced it from Belo to the extreme western point: I remarked however that the beds of Tin-ore extend at several points into the ocean, and that the primitive rocks pierce the alluvial hills in different places, so as to demonstrate very clearly their conjunction with the veins of Red-Iron-stone Breccia &c.

After these general reflexions I proceed to detail my observations on the southern ridges of the Mánumbing.

The village of Belo is situated at the western extremity of the low alluvial district which extends along the southern coast towards Kutto-wáringin, and is bounded in the north by that range of secondary hills which is laid down on the Map: various veins of secondary rocks of Red-Iron-stone or sand stone &c., pass through it, towards the most prominent points as Tánjong Punie, Tánjong Tádá, the island Sembubuáng &c. (I formed this opinion from the colour and appearance of these rocks in passing near the shore in a boat, as circumstances at the time did not permit me to make an examination.)

In the vicinity of Belo I found numerous large blocks of Breccia, which were brought hither from the neighbouring rocks: these gave a striking indication of the peculiarity which this part of the island affords, in a greater proportion of Iron which enters their composition. Their fracture exposes nodules of brown ochre comprised in a compact substance consisting of fragments of silex and Red-Iron-stone.

The banks of the river of Belo are lined with a beautiful white sand which is also observed along the shore from here to the western extremity, and is truly characteristic of the composition of the solid parts or the substances which form the basis of Bánká.

Between Belo and Penjálin Belo (the next rivulet pursuing the coast to the westward) a considerable plain is left at the foot of the lowest ridge or of the lowest gradation of the successive acclivities of the large mountain. It is covered with black mould and with sand accumulated by the rivulets from the neighbouring hills: vegegetation here is very luxuriant. At Penjálin Belo the hills descend to the sea side, they are also covered with a deep vegetable mould, which being removed one meets a yellow sand. In several points where the extremity of the hill is occasionally exposed to the action

of the ocean at hightide deep and extensive layers of *pure clay* appear in view: they are mostly of a white colour elegantly variegated with red, resembling those above mentioned found at the river of Kámpák and in many other parts of the island. Some portions of the general mass are less pure and contain an admixture of minute siliceous particles. Loose fragments of Breccia are likewise strewed along the shore, but these appear to have been removed out of their natural situation. The usual road between the village of Penjalin Belo and Rárgám passes obliquely over the alluvial range about half a mile from the shore: the substances which appear on the surface are amygdaloids in fixed veins, from which numerous fragments have been detached and strewed in all directions on the road. Their nature is highly diversified. Some are compact, and consist chiefly of the substance of the Red-Iron-stone, containing minute particles of quartz; in others the particles are large and loosely connected by an ochreous cement.

After a gradual declivity the road enters the stratified district which contains the mines of Rángam. These belong to the kind called Kolong or large mines. The stratification of the pit on which the workmen had lately been employed was similar to that of the mines in the northern district. It consisted of alternate layers of sand differently coloured by the intervening clay. The black substance or clay which almost universally exists in masses in the stratified districts was very abundant, and the constitution of the stratum containing the ore, was explained by the substances remaining at the aqueducts. I noticed and collected the following:

1. Imperfect granite (granitello of Saussure) consisting exclusively of quartz and schorl: the latter collected in fasciculæ made up of many needle shaped crystals: the stone is generally of a loose texture and in a state of incipient decomposition.

2. The same substance containing felspar which is decomposed and appears on the fracture as white clay.

3. Perfect granite in a state of decomposition: resembling a clayey mass in which quartz and mica are imbedded.

4. Irregular masses of pure quartz.

5. Pure quartz crystallized.

6. Variegated mixture of quartz and felspar resembling the same substance found at the aqueducts of the mines of the northern division.

7. Felspar in small masses rounded by attrition.

8. Masses of apparently pure felspar of a white or reddish colour appearing spongy from the progress of decomposition.

2. Sandstone, compact, intersected by veins of a white siliceous substance.

The pit which has last been worked is situated near the village of Rángám: a river of the same name rises from the eastern appendage of the Mánumbing and discharges itself into the sea about one fourth of a mile west of the village. Between this and the next river, Sungie Páit, a vein of granite rocks descends from the Gunong Kukus to the south and forms the point called Tánjong Páhit. In my excursions, I crossed the termination of one of the rocks near the sea. The granite consisted here chiefly of quartz and felspar: the latter had acquired a yellow colour from its long exposure to sea water: mica and schorl were irregularly dispersed through the other substances.

In the same tract (between the rivers of Rángám and Páit) I discovered near the declivities of one of the hills an extensive vein of a rock of a peculiar kind. It must be considered as an aggregate rock and resembles in a small degree the siliceous rocks of Kámpák and the pile of rocks near Lámpur, but it is essentially different from both.

The basis of the stone, as it shews itself on the fracture, consists of a substance of a blueish colour approaching the nature of Hornblende or Basalt; this is crossed or intersected by white veins of substances of two different kinds. The substance of one is semitransparent, crystallized and evidently of the nature of pure quartz, that of the other is of a somewhat dull or pearly white and resembles felspar. The breadth of the veins is very variable, increasing and decreasing during their course, from less than one-fourth of a line to more than half an inch in thickness: their distribution through the blueish mass is also highly irregular, and strikingly different from that of the intersecting veins of the rocks above mentioned, in no instance circumscribing figures of which the form can be regularly defined.

This vein consists of a number of separate rocks projecting about 3 or 4 feet beyond the surface and covering a space of nearly 100 yards in circumference. Their external form is as irregular as their internal structure. The surface is marked with numerous deep excavations, the substance of the white intersecting lines has remained while the blueish mass which composes the stone has been dissolved,

it is therefore covered with cellulosities. The colour in general is white; some portions are enclosed by a coating of regularly formed transparent rock crystals, while others are variegated with lines and spots of a dull milky white, in many places the surface is reticulated.

In the component parts of this rock we meet again the substances most abounding in the primitive portions of the island: the white intersecting lines exhibit quartz and felspar, and the blueish substance forming the body of the stone is also of a siliceous nature.

On the further course to the westward, several hundred yards from this rock, an extensive vein of sand-stone stretches across the low plain; it is of a white colour and close grain. Numerous large fragments of siliceous stone, resembling those found at the aqueducts, were collected in one place near a rivulet; but none of the persons who accompanied me was able to inform me with certainty whether or not a mine had been formerly worked on this spot. In the river of Sungie Páit as well as in the other rivulets which pass through the plain on the foot of the alluvial ridges, the loose fragments are mostly of a siliceous nature and derived from the decomposed primitive rocks of the Mánumbing and its appendages.

Between the river Sungie Páit and Sungie Báru the road passes near the shore at the foot of the alluvial ridge, which is very steep and being completely covered by vegetation and concealed by a thick vegetable mould, afforded no opportunities for observations.

On my first route from Penjálin-Belo to Minto, my attention was attracted at this village by a peculiar kind of Breccias greatly different in their general aspect from all that I had hitherto observed: I had no opportunity at this time of comparing them with others: after my return to Minto I devoted some time to their examination. The space which these Breccias occupy, is, as far as I could determine, confined between the rivers of Sungie-Báru and Teluk Robeyá, but on account of their tabular form they are carried in all directions through the neighbourhood for various domestic purposes, for building, tombstones &c. In the tract just mentioned, they are found, both in fixed situations on the sides of the alluvial ridge, and in detached masses in the low plain, to the boundary of the ocean. At the extremity of one of the smaller ridges terminating abruptly near the shore, they cover an extensive surface; I here took the opportunity to examine their form and composition.

Most of the fragments here have, upon the whole, a plain or tabular form which is more or less regular; some have an even surface, determinate thickness and regular sides, resembling in some degree slabs or planes prepared by art; others are curved or conchoidal. Among these are dispersed huge irregular masses or blocks from the thickness of a few inches to that of several feet. Their diversity of form and colour scarcely admits of a definite description, and the detached masses and planes afford here a spectacle approaching to the grotesque or whimsical. The fragments resemble in some degree the rude Breccias of Tshengál, above described, but they are both more numerous in one spot and more regular, besides, being washed by the sea at high water, the varieties of colour always appear distinctly on the surface. A lively brown forms the basis, which is spotted with white, yellow and grey, of different shades.

The uniting medium or cement of those Breccias is ferruginous, with varying proportions of admixture of clay and silex; it is a modification of the Iron-ore which forms so large a part of the basis of Bánká, and which in the previous descriptions has been called Red-Iron-stone. It is mostly of a dark brown colour, compact, and even where apparently most pure or unmixed, enclosing numerous particles of a minute siliceous sand. Some fragments consist entirely of this combination, while in others it forms the cement uniting those substances, which are also found detached in the alluvial ranges of the neighbourhood.

The most common substances which enter into the composition of these Breccias are

1st. *Sand-stone* of different degrees of minuteness of grain, and highly diversified in colour and compactness.

2nd. Portions of the siliceous rock above described viz. No. 152 of the descriptive catalogue.

3rd. Iron-stone, red, brown and black in almost every form in which they occur on the Island.

4th. Nodules of clay, often consisting of layers of alternating colours.

5th. Fragments of pure quartz.

6th. Nodules of clay and sand united in different degrees of compactness, often resembling in their fracture the masses of these substances found at the mines.

7th. In one instance only I found a fragment of granite, it was

detached from the mass of Breccias and united to a portion of sandstone.

The separate fragments which were united by the cement were all rounded at the edges and shewed distinctly the marks of attrition: the large planes, slabs or masses which covered the surface above mentioned were very durable, and appeared greatly insensible to the usual causes producing a decomposition of the rocks on this Island. In a few cases only the cement was loose and ochreous. I examined one point at the extremity of the hill which consisted of a layer of the detached fragments entering into the composition of these Breccias, bedded in pure clay; many had been separated by the occasional action of the sea, and were strewed over the plain.

The space occupied by these rocks extends from Sungie Báru towards Teluk Robiyá, but I have not been able at all points to trace its conjunction with the other mineral substances of the neighbourhod. Near the village Sungie Báru I observed it in continued fixed veins of rocks projecting from the surface. One of these veins in particular attracted my notice; it extended from the declivity of the hill towards the ocean, in an inclining position and forming with the horizon an angle of about 35 degrees. It consisted of a regular equal stratum of the substance which forms the uniting medium of these Breccias, the fracture was very compact, of a dark brown colour, exhibiting very minute specks of silex: the surface was regularly tabular and smooth for a length of more than 12 feet; to the inferior portion was united another regular layer less compact, of a brick red colour, made up of particles of sand and ochre.

At the extremity of this alluvial hill, I remarked an extensive layer of large rounded fragments of sandstone and of nodules of clay, presenting different colours on the fracture. I notice this at present as I had previously observed in a section of a hill at Fort Nugent the same substances alternating with beds of the common * of the island.

In the same tract of coast, comprised between the rivers of Sungie-Báru and Teluk Robiyá, in conjunction with the Poudingues just described, we meet the commencement of a most extensive *deposit of Iron-ore*. It is my object at present to describe some of its forms and modifications, and to point out those substances which intersect or alternate with it, following the coast towards the

* Sic Orig.

western extremity of the island. The abundance of Iron in the uniting medium of the Poudingues of Sungie Báru has already been mentioned; those I met on my further track afford still stronger indications of this abundance. The Iron-ore here is the basis, and the particles of the Poudingue adhere to it only in small proportion. The veins and beds of these and of the Iron-ores intersect and are imposed upon each other in many points, in the space between the two rivers and a considerable distance westward of Teluk Robiyá. The commencement of this depository of Iron-ore is an extensive stratum in conjunction with the district of Poudingues, in the west; it composed a length of several hundred yards of the extremity of the hill which is washed by the ocean at high tide: it varies in height from 20 to 30 feet and is only very superficially covered with soil. The ore appears in the stratum in several different forms, but chiefly in laminæ and nodules. In many portions the laminæ are compact and disposed horizontally or slightly undulating, in others they are arranged obliquely diverging, and leave intermediate spaces which are filled by an earthy substance. The colour is black, of varying shades inclining to grey or blueish, and the surface is maculated with yellow ochreous spots. The thickness of the separate laminæ varies from several lines to several inches: it often shows itself in uniform masses: the fracture is semi-metallic and portions of the laminæ are often covered with minute crystals.

From the lower termination of this stratum the ore extends nearly half a mile towards the shore, stretching at the same time several hundred yards east and west. The surface here, which has generally the same black or blueish colour, exposes principally nodules, some of which are of immense size. They appear externally as if composed of concentric layers, but on removing them from their fixed situation they separate into irregular masses. The fracture is more compact and the colour more uniformly of a semi-metallic lustre than in the laminæ of the large layer above.

These ores belong to the species of Black-Iron-stone, but many of the portions approach the nature of the argillaceous or Bog-Iron-ore. The disposition to form regular nodules (which will be exemplified in the southern appearances on this depository) is evident in many of the fragments of the lower plain, and some of the superior layer must be considered as *Bog-Iron-ore*. Not far from the western extremity of these strata large rocks of Red-Iron-stone are dispersed on the surface, many of which appear as brown ochre more

or less pure; to some of these masses, Poudingue or sand-stone are agglutinated. After an interruption of several hundred yards the continuation of the lower stratum appears again before and a little westward of the mouth of the river Teluk-Robiyá. A plain more extensive than the one last mentioned is here covered with Black-Iron-stone, masses of a great variety of configuration are spread over it: the external colour is dark brown or black of a blueish or steel-grey hue. Their form is highly irregular, tuberous or rudely botryoidal, many of the portions are excavated, resembling broken vessels or affording various grotesque figures and representations. In one instance a large mass resembling the trunk of a tree is covered with it: the fracture of several fragments which I separated indicates a vegetable substance, some portions are excavated or tubular. The Black-Iron-stone, here, is rarely pure, it is in most instances united to the masses of Poudingue in the neighbourhood. The fracture is compact or striped with bands of different colours, it is mostly variegated with quartz, and nodules of ochre often appear on it.

With this Black-Iron-stone, pyrites is plentifully mixed: it appears in the form of nodules on or below the surface; these are in general, globular, compressed or reniform; many are often united together and form botryoidal masses. They frequently adhere by intervening particles of quartz. The fracture represents a dark, steel-grey ground, spangled with numerous minute metallic particles. On being preserved some time most of the nodules decompose spontaneously like other pyrites; they burst in many places, an efflorescence of slender delicate crystals protrudes, and finally the whole mass crumbles to pieces.

Many of the masses which I examined to the west of the discharge of the river of Teluk Robiyá exemplify the manner in which the Black-Iron-stone passes into Poudingues. It appears as a cement uniting the various substances above mentioned but particularly particles of quartz. Some of the Poudingues consist of regularly alternating, dark coloured, striæ of various shades; the sand-stone and ochre are observed in large proportion.

This compound district of Iron-ores and Poudingues is here intersected by a branch of the stratum of Tin-ore following the course of the Teluk Robiyá. Quantities of ore have been carried down the river by the current, and being mixed with the sand along the shore have been collected by the natives. The termination of this stratum is indicated by the substances usually found at the mines.

At the eastern side of the river I collected on the beach, and from the layer of sand and clay which terminates the stratum, the following specimens:

1. Granite containing fasciculae of schorl, resembling the rocks of the mountain Mánumbing.
2. Granite in a state of separation of its particles similar to that at the mines of Rángám.
3. A nodule consisting of small crystals of quartz united to a fragment of Red-Iron-stone.
4. Fragments of sand stone of various kinds.
5. Granite with the fragments of felspar in a state of decomposition appearing as a white powder on the fracture.

The western side of the river is likewise bounded by a deep layer of clay and sand, resembling those usually found at the mines and containing masses of Poudingue (different from the dark coloured ferruginous Poudingues of the neighbourhood) and small fragments of granite and quartz.

The tract bounding the course of this river to its rise from the Mánumbing has been very productive in Tin, and a large establishment of Chinese existed here formerly who have in a great degree exhausted the strata of ore.

Between the plain of Black-Iron-stone near the river Teluk-Rubiyá and the discharge of the river Minto-táwár, I found, at the borders of the sea, no traces of the large depository of Iron ore, but it appears again on Minto hill. On the highest part of the alluvial ridge above the central part of the town of Minto and near the banks of the river, an establishment has lately been formed, on behalf of government, consisting of accommodations for the Resident and officers of the Garrison, barracks for the troops, and other public buildings. In the environs of this establishment, I concluded my mineralogical remarks on the Island. I shall mention, in the first place, the indications of the large depository of ore. The most common form in which it appeared was as Red-Iron-stone, but in many cases it partook more of the nature of Bog-Iron-ore, or it passed into the Argillaceous ore or into the Black-Iron-stone. These varieties occured in extensive veins or continued series of rocks projecting beyond the surface or slightly covered with soil and sand. Their constitution will appear in some measure from the specimens here collected, viz.

1. *Black-Iron-stone*, the fracture uncommonly dark, many por-

tions of a semi-metallic lustre, the surface covered with small tubercles, very ponderous.

2. *Bog-Iron-ore*, the fracture exhibiting laminæ of irregular disposition, the interstices filled with ochreous earth.

3. *Red-Iron-stone* of a prismatic or rhomboidal form. I collected various specimens here which are completely regular; some fragments are trapezoidal.

4. *Red-Iron-stone*, the form approaching to stalactitic.

5. *Red-Iron-stone*, the fracture regularly striped with alternate bands disposed horizontally or circularly in concentric layers.

6. *Red-Iron-stone*, the fracture cellular, the cavities filled with substances of different colours.

7. *Red-Iron-stone*, approaching the nature of Bog-Iron-ore.

8. *Compact Red-Iron-stone* similar to the cement of the Poudingues of Sungie Báru, the fracture dark coloured and shewing minute particles of quartz.

The establishment, above mentioned, is situated near the southern boundary of the stratified district surrounding the mountain Mánumbing. Numerous remains of Tin-mines are found in the vicinity: these exhibit the usual appearances of deserted mines, a naked surface or an incipient vegetation. Extensive aqueducts are also remaining; the supply of water was obtained from the numerous rivulets flowing from the mountain Mánumbing or from the branches of the rivers Teluk Roibyá and Minto-Táwár. These remains extend towards the acclivities of the Mánumbing. Beyond the district in which the separate granite rocks project from the surface with the siliceous substances usually found at the mines, I collected rounded fragments of Red-Iron-stone. The strata here, particularly to the east-ward have been very rich in ore of Tin, and very large quantities of that metal were formerly prepared in the district of Minto; in the account of the mines, I shall mention those situations in which, according to the account of the natives, some ore is still remaining.

Many of the former mines were situated on the banks of the river Minto-Táwár, and the fragments carried down the stream and collected during the dry season, in the bed of the river, will explain in some degree, the constitution of the strata in which they were worked. I shall mention them in the order of the abundance in which they were found.

1. Red-Iron-stone in fragments tabular or variously excavated

on the surface, often approaching to botryoidal and in all instances bearing strong marks of attrition. It exhibits many excavations and cellulosities which, appearing on the surface, occasion the irregular form, but the fracture of the interstices is uniformly coloured and compact. The surface sometimes indicates a mixture of red and black Iron-stone.

2. Fragments of sand-stone of different colours and consistence.

3. Fragments of quartz and felspar united to masses of various admixture from decomposed granite.

4. Small fragments of granite.

5. Small fragments of Black-Iron-stone.

The last point of the large depository of Iron which I examined was on the summit of the alluvial ridge to the north of Minto, above the western extremity of the village: on the track hither from the settlement, along the elevated parts of the ridge, I passed over several veins of Red-Iron-stone and Poudingues which will be mentioned in the enumeration of substances found on the ridge.

The depository consists here of an immense bed or accumulation of Argillaceous Iron ore, appearing uniformly of that species which is called Nodular Iron-stone, Aetitis, Eagle-stone or Geodes. That portion of the surface which was exposed to view, and which I examined, was about 50 yards square and completely covered with Geodes. A ditch had been cut along one of the sides to the depth of 10 feet, extending exclusively through the same bed. The spot had been intended for a fort many years ago by the Sultans of Plembáng, and was distinguished by the name of Benting Saribu. It had lately served for the dwelling of the noted exile Rádin Japhar, who had more completely cleared it and opened the ditch; it extended furthest in a direction north and south, and, where I examined it, penetrated exclusively through this accumulation or bed of Geodes, whose extent is probably much greater than the exposed surface, but which it was not in my power to trace in its full extent.

The separate nodules are imposed upon each other with a small quantity of intervening earth. Their size is various, from a diameter of nearly three inches to that of less than one inch. They have uniformly a disposition to a polyhedrous figure; in many cases several of the sides are completely regular and defined. The surface is smooth, inclining to glossy or marked with pits and excavations. Some of the nodules are almost completely regular. I have one specimen in which the two shorter sides forming a trapezium are re-

gularly truncated and tabular, the angles are defined, and the corresponding sides from each angle are completely parallel. If broken they exhibit an extensive cavity; the sides consist of several concentric layers of different colours: the interior is vitrious, glossy and covered with a grey powder, the surface of this is very uneven and often exhibits broken vesicles. They produce, in most cases, the same rattling noise which is common in the Geodes of other countries. Some are entirely compact: they have the same form as the others, but when broken exhibit a united mass consisting of stripes of different shades of brown and black.

I had no opportunity to follow the depository to its termination in the west: but the examination from Sungie Báru to the western extremity of the town of Minto, an extent of nearly 4 miles, was satisfactory and instructive. In the north it is in conjunction at many points with the large stratified belt which surrounds the mountain Mánumbing. The constitution of the Poudingues frequently has the greatest resemblance to that kind of Breccia called by the German miners *rothe todte liegende*, which will most distinctly be pointed out in another place.

It remains for me to add a few remarks on the other substances which I observed between Sungie Báru and Benting Sárebu, several of which occupy the space intermediate between the large Depository of Iron and the Poudingues. Many of the observations hitherto detailed were made in the vicinity of the shore, where the action of the ocean has exposed the different substances and afforded an excellent opportunity for observation. The sides of the hills extending through this tract, are mostly covered with soil and sand, through which the veins of rocks occasionally project. In pursuing a direction parallel to the coast on the top of the hill, I traversed, almost north of the mouth of Teluk Robiyá river, a vein of Poudingues which differs from those above mentioned, near the shore, contain a smaller quantity of Iron in the composition. One of the rocks consisted of small fragments of quartz united by a cement of Iron-ore to a Breccia, which appeared almost uniformly variegated on the fracture. Another similar vein occurred, about 100 yards to the west of the river, in which the same general mass contained large fragments of Red-Iron-stone and yellow ochre. In a third the fracture is still more variegated. Large masses of quartz are bedded in the ferruginous cement, and many of the fragments of Red-Iron-stone are regularly striped. After having passed a part of the stra-

tified district, extending to the vicinity of the new establishment, on the west side of the river of the Minto Táwár numerous detached masses of Poudingue are observed on the track towards Benting Sarebu, and though highly diversified resemble in fracture and component parts those already described. These have probably been brought hither from the veins on the acclivities of the hill to be employed for enclosure of the compounds, for walls about the burial-grounds, for tombstones and for various other purposes. The veins of Red-Iron-stone extending to the bed of the river, resemble those already illustrated by a description of the specimens found near the new establishment.

Along the descent of the hill from this place to the town or the river of Minto, extensive veins of sand-stone rocks come into view, after removing the soil, in different places. At one spot, where a new road has been cut through one of these veins and a very large surface has been exposed, I took an opportunity of examining them. The first vein occupied an extensive tract on the foot of the hill, and passed into a similar vein somewhat further eastward, the colour of the stone is pure white, the grain very fine, and it possesses the same disposition to separate into figures with oblique angles and regular plain sides as the siliceous rock at Bátu-lukut near Támpák and the blueish sand-stone found on the road to Jebus: but the cement unites the grains in a very loose manner; when struck with a hammer the rock separates at regular fissures, but many of the fragments crumble away if they are taken up. A white powder shews itself on the fracture and the cement appears to be of an argillaceous nature. By being preserved several months, the specimens cellected here have acquired more hardness and adhesion. On the same descent, about 30 yards lower, in an eastern direction, I found another vein of sand-stone equally extensive, the cement of which is coloured red by the Iron-ochre of the neighbourhood. It is likewise intersected by fissures, and separates spontaneously into rhomboidal figures, planes &c. Some portions appear in irregular masses to which the ochre is agglutinated. These veins of sand-stone occupy the foot and part of the acclivity of the hill, extending towards the river Teluk Robiyá, until they unite with the bed of Poudingue above described.

Eastward of the veins just mentioned I found a similar substance, more compact, of a brown colour, resembling the layers of Poudingue above described. In some of these veins the argillaceous ce-

ment exists very copiously, and these resemble the masses of clay found in various parts of the Island.

The last veins which are in conjunction with the Poudingues are particularly beautiful. In some portions the white or yellow substance of the sand-stone is intersected by delicate veins of a substance resembling the uniting cement of the Poudingues, and various angles and figures present themselves on the fracture: others are already formed into regular Poudingues, and the white sand-stone is united to nodules of Black-Iron-stone.

SECTION III.

VIEW OF THE TIN-MINES ON BANKA.

In the note will be found a general enumeration of those mines which are worked at present, or which were worked in former period.*

* *1. In the Western division.*

Environs of Minto.
- Sungie-babí,
- Darat-lama,
- Sungie-Deyng,
- do. Teluk Robiya,
- Mendshelang,
- Sungie-Reang,
- Andshel,
- Beat,
- Kadur,

Palangas.

Tampelang.

Belo,—At Meng-gelam &c. Pait-Dulang.

Rangam.

2. In the Northern division.

A. Western Peninsula.

In the district of Jebus or Anten.

1. Large (or Kolong) mines.

Upper furnace district.
- Sungie Tango,
- Suntay,

Lower furnace district.
- Sungie-bulak,
- Tayman,
- Siam,

2. Small (or Kulit) mines, (in both districts.)

Sunho,	Sunhowa,
Sunyu,	Soktjoy,
Sunsing,	Tenpo,
Sunwad,	Assun,
Sunwing,	Atshey.

In the district of Klabbet.

1. Large mines.

Sinhin, Sunnie, Yunhin.

2. Small mines.

Nobung,	Tshunlien,
Entshe-aling,	Kayu,
Tshentet,	Lolam,
Tshuntat,	Songkay.

Akkiouw,

In the district of Sungie-bulu.

1. Large mines.

Tayu, Hohin,

2. Small mines.

Sundie, Hapsun.

In the district of Mampang.

1. Large mines.

Sinwad.

2. Small mines.

Sinyong.

B. Eastern Peninsula.

In the district of Blinyu.

1. Large mines.

Towallam, Pandjic,

2. Small mines.

Thuwissa (and several others.)

In the district of Lumut.

1. Large mines.

Hapsun, Lakuntouw, Keighwad.

2. Small mines.

Kloppo (and several others.)

In the district of Sungie-liat.

1. Large mines.

a. Subdivision of *Ayer-Duren.*

Tay-hin.

b. Near the stockade.

Wungin.

2. Small mines.

c. Subdivision of *Lampur.*

Log-him, Nihin.

d. Subdivision of *Ayer-Duren.*

Atshin.

e. Subdivision of *Robo.*

Sungin,	Djin-hin,
Soy-gim,	Tigim,
Tohin,	Stin-gim.

f. Subdivision of *Robo-kli.*

Kingin, Singin.

g. Near the stockade.

Siak-gin, Atshun,

Sungin, Libo.

Lokgin,

h. Subdivision of *Djeniang.*

Sungin.

i. Subdivision of *Katta.*

Nyanli.

District of Marawang.

1. Large mines.

Wehing,

Kimsowa.

I proceed to make a few remarks on the mines noted below, of their present condition, productiveness and the number of workmen employed therein; after which I shall point out those situations which offer themselves for new mines.

1. On the Western division *Minto* and its neighbourhood was the first part of the Island in which mining was attempted. Soon after the accession of Sultan Mahmud Badur-Udin I. to the throne of Plembáng, a large number of Chinese adventurers from this capital, from China, Borneo and the neighbouring islands, opened the the ground in every direction, and by an unremitting perseverence and industry, exhausted the richest and most favourably situated spots, after which they directed their attention to new mines, in other districts.

The Malay inhabitants of Minto have participated in the working of the mines and have had severe contentions with the Chinese: according to information of persons engaged in the former works, communicated to me, about 1000 Ingots (or slabs) might still be obtained annually from the places noted below in the environs of the large mountain. But the Malays are unwilling to undertake the work on the same terms with the Chinese in more productive spots.

The mines of *Rángám* have not been regularly worked during the last periods, as the attention of the inhabitants is in a great measure directed to other pursuits, although the mines are not yet exhausted. This village consists entirely of Chinese; of 60 male inhabitants, 25 are miners.

The mines of *Belo* were opened soon after those of Minto by a

2. Small mines.

Jiheng,	Tjungheng,
Beyu,	Samheng,
Hohing,	Samhok,
Suntshin,	Sunwan,
Bihing,	Kwangyu,
Atshin,	Sinheng or
Sunlie,	Tshengal,

3. *In the South-east division.*

District of Pankal-penang.

(Here all are *small* mines.)

Krassak,	Butshak,
Krassak-Ulu,	Tshuntshit,
Bakung-bawa,	Samwey,
Tshapsawun,	Hunseng,
Bankwang,	Tshing-peng,
Henglie,	Tshin,
Kayu-bessie,	Bakung,
Suymouw,	Bulu,
Siema,	Ayer-Udang,
Kwang-tsie,	Gomuru,
Wang-sing,	Pangkul,
Ayer-Mangkok,	Sungie-kurouw.

District of Tirak.

Mines (small) at Tjablang and several other places.

District of Koba

Koba (and the environs) including Rangouw and Kayu Arro.

District of Poku, and Tubuali.

Including Nyiry and Ulim.

District of Banko-hutto.

Including Balar, Kabal, Permissang and Selan.

native of China, *Assing*: he was the first person who introduced a regular mode of mining on Bánká. The first mines were worked in the vicinity of the present village in various directions near the southern coast of the Island; as the ground was exhausted, the miners gradually retired towards the interior. Two mines are at present worked in this district namely *Meng-gelám and Páit Doulàng*. The former employs 25 miners and is in an improving state; the latter has lately been opened by 13 workmen.

At *Pálángás* 24 Chinese are employed in one considerable mine.

The mines of *Támpelàng* are under no regular discipline at present: they were formerly worked by Chinese and the causes which produced their desertion have been mentioned in the Geographical account. Some Tin is annually manufactured by the mountain people; sufficient store of ore is still remaining to encourage the regular mode of mining followed by the Chinese. At least 25 miners of this nation might here be profitably employed.

In the annexed table I have estimated the aggregate annual produce of the mines of Rángám, Belo, Pálángás and Támpelàng very moderately at 600 Ingots: and after the mines have been carefully administered some time an increase of this number may be reasonably looked for.

2. Mines of the northern Division.

A. In the *western peninsula* the mines are dispersed through the districts of Sungie-Bulu, Mámpáng, Tengá and Klábbet. The most productive mines in this peninsula are those of Jebus situated in the district of Tengá. They were formerly called the mines of Anten, from the name of the settlement or stockade where the chief resided and whither the product was conveyed. In consequence of the more favourable situation for the intercourse with Plembáng the establishment has been removed to Jebus, where a more regular stockade has been constructed.

The miners of Jebus are divided, according to their situation, into those of the Upper and those of the Lower furnace. Of the former that of *Sungie Tángo* (of the Chinese, Sungie Mentángor of the Natives) is the most important. It employs 42 miners and the ground is very productive. During the last season of smelting (in April &c. 1813), above 2000 Ingots were produced from the ore which had been collected in 15 preceding months.

The mine of *Suntáy* employs 25 miners and has produced in the period just mentioned nearly 1000 Ingots. The principal mine of

the Lower furnace is at *Sungie Bulák:* here 32 hands are employed, and the ore collected in the same space of time above mentioned was upwards of 1000 Ingots. The mines of *Siám* and *Táynám*, likewise in the district of the Lower furnace, give separately work to 13 miners, but they are conducted with less regularity than the three large mines first enumerated: they are capable of producing if properly administered, collectively, about 1000 Ingots annually.

It may be noted, regarding the mines of this district,

1. That they command a sufficient supply of water from a stream, during the greatest part of the year,

2. That the ground contains, according to all indications, a considerable store of ore, and may be worked for a number of successive years,

3. That a considerable proportion of the miners are married, which has a great effect in fixing them to a particular spot, and making them useful in their profession,

4. That the dispostion of the miners is obstinate, highminded and riotous.

In the 10 small mines of this district 29 miners are employed at present: they produce collectively in common periods, 1000 Ingots a year.

In the district of Klábbet 2 large and 9 small mines are at present worked: they are all situated in the central part of the western peninsula, within the circumference of a few miles of the Upper-furnace district above mentioned. The first large mine is that of *Sinhin*: it employs 32 miners and in regard to resources and productiveness resembles the three large mines of the district of Jebus. At a reasonable estimate the annual produce of this mine somewhat exceeds 100 Ingots. The mine of *Sunnie* employs 21 workmen and 500 Ingots at least may annually be expected from it: of the small mines of Blábet, nine in number, several are favourably situated: the aggregate annual produce may at a low rate be calculated at 100 slabs. The large mine of *Yunhin* is at present neglected in this district. A considerable store of ore is said to be remaining but its depth exceeds that of the other mines, and the extraction of the ore requires, in consequence, an additional expense.

In the district of *Sungie-bulu* the large mine of *Táyu* is worked by 28 miners: it is situated near the central mine district of this peninsula, in the neighbourhood of the mine of Siam. Besides the two small mines, in which about 7 hands are at work, an attempt

has lately been made to open again the neglected mine of Hohin, and a party of workmen has been engaged for this purpose. The aggregate of what may be expected from all these mines, after a liberal calculation, is 1500 Ingots annually, which supposes however, that the attempt of working again the mine of Hohin does not entirely fail, as the two small mines are nearly exhausted.

In the district of Mámpáng a commencement has lately been made to work several mines. The Kongsy or chief of Belinyu obtained the permission of the Sultan for opening the ground shortly before Bánká became a British possession. One of these is a large mine and employs 8 workmen, the other is a small one and is worked by 4. The situation of both, as far as experience has hitherto shewn, is favourable, in regard to the store of ore, and they both command a supply of water: the works have been laid out with judgment, but the settlement labours under the usual disadvantages of new establishments on Bánká; the climate in many situations, especially near the sea, is unwholesome, and the settlement is exposed to the visits of smugglers and pirates. The productiveness of this district will depend in a great degree on the number of miners that can be induced to settle here from other parts of the Island: with those necessary improvements which may soon be expected, this district will yield annually at least 600 Ingots, and a considerable increase will probably follow if the mines are well administered.

In the Eastern peninsula of the northern portion of Bánká, the mines are distributed through the districts of *Belinyu*, *Lumut*, *Sugie-liát and Máráwáng*.

The mines of Belinyu were opened soon after those of Belo by a Chinese subject of Plembáng named Demang Ko; and some extensive works were commenced about the same time at Pándjie by a Chinese of the name of *Bing*; both were afterwards united and administered by one chief. The only productive mine which is now worked in this district is that of Towállám, it employs 11 miners.

Several small mines have been worked until lately. The mines of this district have for many years been in a declining state. In the year 1805 the average annual produce was 1200 Ingots; this has gradually decreased to about one half of that number. In the mine of Pándjie the labours have been entirely discontinued. In a considerable village established here 16 miners are remainingg, most of whom are married and have directed their attention to other pur-

suits. They assert that an opportunity remains for opening a new mine a few miles to the eastward of their village.

The present annual produce of Belinyu, rarely exceeds 600 Ingots: what may reasonably be expected from about 30 miners that are now unemployed will be enumerated in the general table.

In the district of *Lumut*, three large mines are worked, namely *Hápsun*, *Lákuntouw* and *Keighwád*: they are of less extent than the large or Kolong mines of the other districts, and are undertaken by one chief miner, (Kongsy) who engages so many assistants as his works require. The mine of Hapsun employs at present 4 workmen; that of Lákuntouw 7 and that of Keighwád 5.

The remarks on the declining state of the mines of Belinyu apply equally to this district, and several of the mines formerly worked have been exhausted. According to a statement which was made up from the books of the chief, the annual produce during the last 20 years did on an average not much exceed 400 Ingots.

Through the extensive district of Sungie-liát 20 mines are dispersed of which 2 only are large mines: they will generally be enumerated in the table. The mines of this district were first opened by the family of the Chinese Assing above mentioned. His son Demang Dyaya Laxana obtained from the Sultan the privilege of working them about 40 years ago. Since this period the most favourable and productive situations have been successively exhausted and the produce has gradually decreased. The average number of Ingots which may be expected annually from these mines collectively at present is 2600; this calculation supposes that the district of *Jeniáng*, which has been less worked than other parts, is carefully administered, and that a large mine lately opened near the stockade will answer the expectations that have been formed of it.

In the district of *Márawáng* 15 mines are worked, of which 2 are large mines. One employs 10 workmen and produces on an average 300 Ingots annually, the other was formerly neglected in consequence of bad management. Thirty miners have lately united to work it again, and have made some progress: the investigations that have been made indicate a store of ore, and the increase of the annual produce of Máráwáng will depend, in a great measure, on this mine. Of the small mines 6 are in a favourable state and according to moderate calculation will yield annually 800 Ingots; the others are nearly exhausted or want the necessary supply of water. I have estimated the annual produce of this district at 1500 Ingots.

3. *Mines in the third* or *south-east division.*

In the south-east division of the Island I have visited only the districts of Pángkál-pináng and Tirák. The former is, next to Jebus and Sungie-liát, the most important and productive portion of Bánká. It contains at present 18 mines dispersed through the subdivisions of Messu, Bákung, Káyu-Bessie, Ayer-mánkok and Bángkwáng in which 63 miners are employed. Although the districts in which these mines are situated have been worked nearly thirty successive years, they still contain a considerable store of ore. It is supposed by the best informed persons that, with a careful superintendence of the mines and the necessary direction of the labours of the miners, the aggregate annual produce will amount agreeably to a moderate computation to 4000 Ingots.

The mines of *Tirák* were formerly under the superintendence of the chief of Máráwáng: and have been opened within the last 10 years. They have during several seasons been neglected, but if properly administered the former annual product of 400 Ingots may be expected from them again.

Before I enumerate the districts next in order in this division of the island which supported mines in former periods, I shall mention *Tubuali* near the extremity. This district, although it has greatly participated in the common disasters of this part of Bánká, (which will be detailed in another place) has not like most others been completely ruined and depopulated. In Tubuáli the chief business of mining has hitherto been carried on by the mountain-people; but a number of Chinese miners have lately been introduced, a regular mode of mining is attempted, and an increase may soon be expected in its produce. Considerable improvements are however still to be made, and a large additional number of Chinese miners can be employed with advantage. Much of the future produce of the Island must be expected from this and from the neighbouring districts.

I have estimated the annual produce of Tubuáli including *Nyiry and Ulim* at present, at 1000 Ingots. The latest accounts of the former annual produce do not indeed amount to that number, but as the business has hitherto been carried on very imperfectly by mountain-people alone, I have taken into consideration the introduction of the Chinese and the general improvement and extension of the process of mining. The additional quantity (above the 1000 Ingots mentioned) to be expected in future from Tubuáli will be stated below.

I proceed next to mention those districts in which from various causes, but principally on account of the attacks and ravages of the pirates, the mines have been entirely neglected or deserted.

At the southern boundary of Pángkál-pináng, we meet with *Kobá*, which was formerly one of the most productive districts of Bánká. It supported 22 years ago 80 Chinese miners who worked 15 mines, and produced annually upwards of 3000 Ingots: it includes the subdivisions of *Rángouw* and *Káyu-Arro*, along the eastern coast of the island, while Pángkul and Sungie-Kurouw are generally added to the district of Pángkál-pináng. *Páku* is situated near the center of the island in a direction west to Kobá: although the inhabitants of this district paid more attention to the preparation of Iron from the ores of the neighbourhood, a small quantity of Tin was also manufactured. In the estimate of what may reasonably be expected from these various mines, I have calculated Kobá, including Ráng0uw, Káyu-Arro, and Páku in the first periods at 1250 Ingots annually, provided a sufficient number of Chinese miners can be induced or encouraged to settle there and to recommence the working of the mines. More than double that number may be expected in a few years, after the works have been extended according to the opportunities afforded by productive beds for collecting ore.

The district of Bánko-kutto takes in the long range of Permissáng hills, in the environs of which various mines were formerly worked. These were dispersed through the subdivisions of Bálár, Kábál, Permissáng and Selán, in all which a very inconsiderable portion of a formerly extensive population is now remaining. It will therefore require time and care to derive those advantages from them, which they are capable of affording. From the most credible information which I have been able to obtain, I have estimated the annual produce of these districts collectively, provided the necessary miners can be introduced, at 500 Ingots; which number may be expected to increase as the progress of the settlement advances.

In taking a view of the island of Bánká, it will appear, that most of the larger districts have already supported an establishment; and although the greatest part of the south-east division is now deserted and waste, it formerly possessed an extensive population and very considerable mines. It is evident therefore any *new* situation for a mine, will be comprised in, or at least adjoining to, one or other of the districts already enumerated, for the general limits and extent of which I refer to the map.

In my enquiries after favourable spots for new mines in which the original store contained in the earth, might have been exposed to observation or extraction, the following places were particularly pointed out to me:

1. Dshebu.
2. Mápur.
3. Tengkiyá and
4. Káppu.

The river of *Dshebu* passes several miles to the northward of the stockade of Klábbet; and its neighbourhood, near the confines of the large mining district, is supposed by well informed persons to afford an opportunity for opening a large mine of considerable extent, and in my estimate of an additional produce from the district of Klábbet, as well as of new miners to be introduced, I have taken into consideration.

In the district of *Mápur*, included between Lumut in the west, and the northern parts of Sungie-liát in the east, an attempt is made at the present period to resume a former attempt which was frustrated by the pirates. A number of Chinese miners have associated for this purpose: the condition of the strata, as far as regard, a store of ore is reported to be favourable, but the neighbouring country is almost a complete desert, only a small part of the former population of mountain-people is remaining, and the settlement will require considerable time to recover. In my calculation I have estimated the produce which will probably be afforded when the works have been properly effected, at 500 Ingots annually, which number may be expected to increase from year to year. But no part of the Island is supposed to contain a richer store of ores than the districts of *Tengkiyá* and *Keppu*, at the southern extremity of the Island, forming part of the larger district of Tubuáli: Keppu is situated on a river of the same name, which discharges itself into the straits of Lipár, and Tengkiyá lies not a great distance further east.

As long as Bánká was exposed to the perpetual attacks of the pirates, no person ventured to form an establishment in a part so exposed and distant; but under the present government and administration, the attention is most strongly directed to these two districts: their situation is not distant from Tubuáli, and they may be probably superintended by one person.

In making an estimate of the probable produce from Tengkiyá and Keppu, I can be guided alone by the information obtained from

others. I have procured a statement from several intelligent Malays at Minto, (natives of Plembáng) as well as from various Chinese at Pángkál-pináng who were formerly employed in the mines of the southern part of the Island, according to which each of these districts will be able to furnish, by the regular process of mining carried on by the Chinese, annually 1000 Ingots, and a very considerable increase of this number may be expected when the population and an additional number of Chinese miners, admits of a proportionate extension of the mines.

I shall add a few remarks as to an increase of the produce of those districts which now support the principal mines.

Although the mines in the northern division are at present more extensively worked than those of any other part of the Island, they still admit of an increase, which, in the table annexed, I have estimated as follows, viz.

In Jebus annually.....	1200	Ingots
„ Klabbet (including Dshebu).....	1250	„
„ Sungie-bulu (taking in a new mine lately attempted towards point Tánjong-Támudshá).	250	„
„ Mámpáng (including an additional large mine)	500	„

As to the mines of the eastern peninsula, if new works are undertaken by the miners of Pánje I have calculated an annual increase of the produce of Belinyu of 500 Ingots, while in Máráwáng a small increase only may be expected, probably not exceeding 250 Ingots. The mines of Sungie-liát are already worked to their full extent.

In the district of Pángkál-pináng various new mines may advantageously be attempted, while the present works may be extended, particularly in the subdivisions of Bákung, Bulu, Ayer-Udáng and Gomuru: the deserted mines of Pángkul and Sungie-Kurouw may also be worked again with favourable prospects; and in conformity to these opportunities I have formed the estimate of an increase, to the general amount, of 2000 Ingots. The number of fresh hands required for these new or additional mines is also included in the general table.

From the statements above detailed, the order of the importance and productiveness of the mining districts of Bánká is as follows:

1. Jebus
2. Pángkál-pináng
3. Sungie-liát

4. Klábbet.
5. Máráwáng
6. Sungie-bulu
7. Blinyu
8. Lumut.

I have not included in this statement Mámpáng, Tabuáli and the mines eastward of Minto to Támpeláng, as their supplies depend more than in the other cases on accidental circumstances.

It appears from the annexed table, shewing the quantity of Tin produced on an average annually at the present period that the number of Ingots amounts to 21,600 yielding according to the usual mode of estimation 10,800 piculs of 100 Catties Chinese weight or 133⅓ lbs. Troy each, or 1,440,000 lbs. It would be interesting in various points of view, to trace for a number of ascending years, the annual produce of the mines of Bánká, but for these purpose, no records are left on the island, and we have only the verbal accounts and relations of the old inhabitants to supply as information: these are, however, confirmed by the testimony of many respectable persons at Plembáng and at Batavia, as well as by various documents which remain at the latter place. They tend to prove that the former produce ot Bánká exceeded that of the present time in a manifold proportion.

The most prosperous period of the Island both regarding the supplies obtained from the mines and the general condition of the Inhabitants, was during the reign of Sultan Achmád Nádjá Mudin I, and some time before his accession to the throne, or between the years 1750 and 1775. Sixty thousand piculs, or 120,000 Ingots, is but a moderate estimate of the aggregate produce of the mines during this period, and by most persons supposed to be competent to afford information on the subject, it is rated much greater.

In the year 1770, May 11th. the Governor and Council at Batavia published the following Resolution: " Not to accept from Plembáng, annually, more than 25,000 piculs of Tin: and because this year 5000 piculs above this quantity have been sent here, no more than 20,000 piculs shall, on any account, be accepted the following year: of which timely information shall be sent to the king."

The operation of measures of this kind requires no comment; the clandestine trade to China, which was facilitated by the annual visits of numerous junks and already engrossed at least one half of the produce of the mines, received not only encouragement but sanction,

as the only support of the numerous miners occupied on Bánká, depended on a ready disposal of the manufactured Tin: and it is adduced at present to afford a testimony of the productiveness of Bánká at this time.

Two causes have principally contributed to produce the egregious defection in the annual proceeds of the island.

1. An actual *diminution of the store of ore*, or the gradual exhaustion of the mines in the neighbourhood of the antient settlement; and

2. The concurrence of the various disasters which have harrassed Bánká since the year 1784. The latter will, with more propriety be detailed in another place, on the former I shall add a few remarks.

The period of the discovery of the Tin-mines on Bánká is not very remote; it falls within the first 20 years of the last century, and this (as has already been noticed) shortly preceded the settlement of Minto, during the first year of the reign of Sultan Mahmud Badur-Udin I. Attracted by the prospect of gain, numerous Chinese miners and adventurers resorted to Bánká (as above related,) about this time, and as the stores of ore near the first establishment failed, gradually attempted and removed to other districts, spreading successively through Belo, Klábbet, Sungie-liát, Anten or Jebus, Pángkál-pináng, Máráwáng and Sungie-bulu, selecting the most favourable spots where a rich store of ore combined with a supply of water to facilitate the labours of the miners.

After a lapse of about 30 to 40 years a gradual diminution was observed in many parts of these districts, while others were entirely exhausted and new situations attempted: but still the aggregate annual produce of the Island amounted nearly to the quantity above stated. Since the year 1780 a decrease has become more evident, and after the commencement of the disasters of the island 30,000 piculs were rarely produced in one year. During the last 15 years the annual quantity has gradually lessened. The constitution of the mines elucidates this diminution in a great degree, the ore is uniformly deposited in horizontal beds at no great distance below the surface: These beds have in some instances been immensely productive; by which the abundant supplies of former times are accounted for, when the number of miners was proportionate to the opportunities afforded of collecting ore. The inquisitive shrewdness of the Chinese directed them to the most profitable spots, and in travelling through

the western and the northern division of the Island, one passes extensive surfaces which have been turned up and drained of their contents, exhibiting the remains of former mines and aqueducts.

But, although in the western and in the northern divisions of Bánká, the most productive situations have been exhausted, or their store considerably diminished, yet the annual quantities computed as the present produce of the various mines above mentioned (and which are exhibited in the table) may with little variation be expected, as far as my most careful observations have enabled me to judge, and after the establishment of the new mines of Mápur, Dshebu, Mámpáng, Pándjie, &c., and particularly when the great south-east division is brought into activity and the mines of Kobá, Rángow, Káyu-Arro, Tengkiyá, Kappu, Selán, Permissáng, Bánko-kutto &c. contribute their proportion, the full quantity stated in the table may be expected: this according to my personal calculations and enquiries, assisted by the concurrent testimony of well informed persons, must however, be considered as the *Maximum* to be expected from the mines of Bánká for the next five years, and probably for a longer period, requiring for its production the advantages of a careful administration.

In the future regulation of the affairs of Bánká, it will become an object of primary policy and interest to investigate experimentally those tracts which have in a great measure remained untouched, in order, as the beds near the present establishments are exhausted, to remove the miners to new situations in those districts which contain a larger store of ore.

To these remarks, I shall only add a few documents which were afforded me by the books of the Kongsies (or chiefs of the mines) as to the annual produce in the following districts for a small number of successive years:

The mines of Jebus produced:

In the year	1806	Ingots	4542
„	„	1807	„	6217
„	„	1808	„	6106
„	„	1809	„	5642
„	„	1810	„	6874
„	„	1811	„	5445

The mines of Klabbet produced:

In the year	1805	Ingots	6193
„	„	1806	„	4967
„	„	1807	„	4784
„	„	1808	„	5178
„	„	1809	„	4762
„	„	1810	„	4034
„	„	1811	„	2601

The mines of Sungie-bulu produced:

In the year	1799	Ingots	1503
„	„	1800	„	4643
„	„	1801	„	3606
„	„	1802	„	4400
„	„	1803	„	3402
„	„	1804	„	4968
„	„	1805	„	6595

"	"	1806	"	4659
"	"	1807	"	2395
"	"	1808	"	5169
"	"	1809	"	3817
"	"	1810	"	1999
"	"	1811	"	981
"	"	1812	"	1057

The mines of Belinyu produced:

In the year		1805	Ingots	1247
"	"	1806	"	1182
"	"	1807	"	931
"	"	1808	"	644
"	"	1809	"	753
"	"	1810	"	581
"	"	1811	"	624

The mines of Lumut produced:

In the year		1794	Ingots	400
"	"	1795	"	400
"	"	1796	"	390
"	"	1797	"	355
"	"	1798	"	400
"	"	1799	"	400
"	"	1800	"	410
"	"	1801	"	402
"	"	1802	"	400
"	"	1803	"	405
"	"	1804	"	400
"	"	1805	"	410
"	"	1806	"	412
"	"	1807	"	420
"	"	1808	"	410
"	"	1809	"	400
"	"	1810	"	425
"	"	1811	"	410
"	"	1812	"	400
"	"	1813	"	322

The mines of Marawang produced:

In the year		1799	Ingots	4300
"	"	1800	"	4590
"	"	1801	"	4623
"	"	1802	"	3701
"	"	1803	"	3353
"	"	1804	"	3309
"	"	1805	"	4062
"	"	1806	"	2389
"	"	1807	"	2139
"	"	1808	"	3145
"	"	1809	"	2349
"	"	1810	"	2339
"	"	1811	"	1395
"	"	1812	"	1491

As to the annexed table, shewing the quantity of Tin produced on Bánká, I shall only observe, that most of it is compiled from inquiries on the spot, and from a personal inspection of more of the mines during a journey through the island, to which has been added whatever information or instruction could be obtained from intelligent natives, and from the books and annotations of the Kongsies or administrators of the mines during the sovereignty of Plembáng.

SKETCH OF THE PROCESS OF MINING AND THE ECONOMY OF THE MINES.

The process of mining on Bánká is very simple : it consists in the formation of a pit or excavation of a square or oblong form, perforating the ground perpendicularly to the beds or strata containing the ore of Tin, which are rarely far below the surface, and in a proper application of the water to facilitate the different labours of the mines and the washing of the ore. The miners are not obliged, as in other countries, where the metals are concealed in deep veins to employ difficult operations or expensive machinery. The process requires little previous instruction and is mostly attempted by persons whose only qualification is a robust constitution : and the more aged and experienced miners direct the labours of the beginners.

The beds are generally extensive and horizontal : when they have once been perforated, we observe the miners carrying on pits in succession from the same surface, and following their direction until the work is abandoned in consequence of the exhaustion of the ore, a greater inclination and depth than ordinary, or a deficient supply of water. Thus in travelling through the country, surfaces of several square miles are observed which have been turned up by the process of mining. It may be pertinent to remark here that this constitution of the mines on the island explains in a great degree the deficiency which is observed in the supplies of late years : the beds are often very extensive and rich but not deep, and in many of the districts which formerly yielded annually 10,000 Ingots, scarcely one fifth part of that number can now be obtained.

To direct the miners in attempting a new work, they examine the ground in the usual manner by *boring :* but the indications afforded by this means are not infallible, and many spots, which yield the most sanguine expectations, are finally abandoned in consequence of the unequal distribution of the ore through the strata. Having selected a situation with favorable indications the Chinese on Bánká are apt to indulge considerably in adventure ; and the former system of administration, during the sovereignty of Plembáng, by granting advances in the various necessaries of life, without much regard to economy, has rather encouraged this disposition.

The surface of Bánká is in general undulating, the beds of ore are often found in the vallies, and in many cases are accompanied by a

stream of water. The island is abundantly supplied with rivulets and rivers, which circumstance has doubtless contributed to assist in furnishing those copious supplies in former times, when the ore was collected from the richest beds, with a labour and expense very trifling if compared with the working of mines in other countries.

The mines are of two kinds, large mines, which, on account of their depth, are called *Kolongs* by the natives, and small mines which are called *Kulits* or shells, from their superficial situation.

Of the former kind there are at present worked on Bánká, those mentioned in the previous view of the mines and the table, where the number of hands employed in each has likewise been pointed out. The large mines are of various extent, the average number of miners is from 25 to 30; the largest mine employs at present 42 and the smallest 10 hands.

There is, in general, no difference of rank or condition among the workmen at one mine; the work is undertaken in fellowship and they share equally in the produce; the labour connected with the process of mining is performed by all indiscriminately. In the district of Lumut alone, three large mines are undertaken each by a chief miner who engages so many coolies as his work may require.

Having selected a spot which affords a favourable prospect for mining, the ground is cleared from the ancient forest which covers every part of Bánká, the pit is sketched out, a canal is conducted from the nearest rivulet or river, and the miners begin to remove the layers which cover beds of ore. The superficial extent of a pit is various: I found several more than 100 feet long and nearly as wide: the usual depth sufficiently appears from the preceding mineralogical details: if it exceeds the measure there stated, the work is generally neglected unless the miners are indulged according to a former custom, with a gratuitous advance, the principles of which will be described in the sequel.

The excavation of a pit having been carried on to a certain depth, an accumulation of water often takes place from rains or from wells accidentally encountered in the progress of the work. To remove this a well or water mill is employed, of Chinese invention (a description of which is found in various travels in China.) It is turned by a branch of a neighbouring stream or by one of the workmen who, supporting his arms on a frame placed for the purpose, moves the wheel by treading with his feet. The construction of the machine is simple. It consist of a number of small oblong planks of

equal size fitting exactly into a long wooden canal or trough which is placed obliquely into the mine, they are united to each other by joints and thus connected into a chain, which is kept in constant rotatory motion by the large wheel, while a small wheel attached to the lower extremity of the trough directs the planks, during their rotation into the water; each dips, takes up or moves forward a small quantity, and by their number they produce a returning stream from the collection at the bottom of the mine. The substances composing the strata, which have been repeatedly enumerated in the preceding mineralogical description, are now successively carried out: for this purpose each miner employs two small baskets which are suspended by a lever across the shoulders in the usual manner of carrying weights; to facilitate the descent into and ascent from the pits, large trunks of trees are placed obliquely in them, into which steps are cut to support the feet.

The progress of the work and the time requisite for carrying out the superior strata, depend on the situation of the pit and the number of miners employed: in the large mines of Jebus and Klábbet 3 to 4 months are generally required for this purpose.

On arriving at the stratum containing the ore, its contents are deposited separately in heaps near the aqueducts, so as to be conveniently situated for the process of washing: the larger fragments being removed, the appearance of the white clay or Kong-táy apprizes the miners of the termination of the stratum.

I observed in several instances, that before the miners had penetrated far below the surface, a canal was conducted along the pit into which the mould and upper strata were thrown and thus carried away by the current, saving by this means a great deal of labour; this method however is more generally employed in *small* or *kulit* mines, whose principles of working are otherwise the same. But as they are always attempted comparatively by few hands, such situations only are selected where the ore is near the surface. In all the small mines which I visited I observed a canal near the pit to assist in carrying away the upper strata, as they were thrown in by the miners. These mines are uniformly less regular in their excavation than the large mines, and are in most cases laid out on an inclining ground which greatly facilitates the removal of the superfluous earth: besides that a collection of water must be prevented, as this method rarely admits of the use of the machine or wheel to draw it out.

It may be remarked however that in the eastern parts of the island through the districts of Sungie-liát, Máráwáng, Pángkál-pináng &c. the strata are in general near the surface, and in extensive plains: here the mining is undertaken in a more regular manner than is customony in small mines and often by parties of miners united in fellowship.

The whole contents of the stratum containing the ore being accumulated, they are subjected to the *process of washing*. For this purpose the most convenient aqueduct is employed: it is carefully lined with the bark of large trees and a stronger current is produced by directing into it a copious supply of water, or by causing a gentle inclination. The contents of the stratum are thrown in, in divided quantities, and agitated in the usual manner by the workmen, with a hoe. The particles of ore subside by means of their gravity, the earth is carried away by the current, and the fragments of stone are separated by small baskets and sieves and thrown on the side of the canal. These afforded me in many instances an instructive opportunity of noticing the component parts of the strata and of collecting descriptive specimens. The purified ore which is collected from time to time is stored in a shed erected for the purpose in a convenient situation.

A sufficient quantity of ore having accumulated it is *refined* or *smelted;* in favourable seasons this process is performed twice annually, in common seasons once. The space between the months of February and April is generally devoted to this purpose.

The *process of smelting* is performed in a spacious open shed about 75 feet long, 35 feet broad and in the middle 24 feet high. The upper portion of the roof is separated from the lower by an intervening opening of about 2 feet, to prevent ignition: the roof is inclining. The shed is constructed of rough materials without any art or ornament.

Each building contains a sufficient space to carry on two separate operations. The central portion is occupied by the furnaces and ventilators, while the extremities in each direction are devoted to the workmen and to the various requisites in the business of smelting. Here the ore is placed in readiness, the coals are arranged, and the implements collected before the operation is commenced. That portion of the floor of the building which corresponds to the two furnaces, is somewhat wider than the extremities, and elevated to a proportionate height, to enable the workmen to set the ventilators

in motion. Each of the two opposite compartments, which in all respects are equal, contains, besides the furnace, an oblong excavation filled with sand, in which the moulds are formed for casting the metal, and, at the extremity, a similar excavation for macerating the Dross, which after pounding, is fused a second time. At one corner in each extremity is a somewhat elevated platform for the convenience of the workmen, spectators &c.,

The *furnace* has a regular oblong form ; it is ten feet long, four feet wide and four feet high: its posterior part is elevated into a narrow wall, extending about three feet above the rest which separates it from the ventilators, and prevents the communication of fire, when the furnace is ignited. The *fire-place* occupies the middle portion of the furnace; its superior opening has the form of a section of an elipsis, the greatest diameter being 20 inches; it descends perpendicularly three feet into the body of the furnace, and towards the lower extremity is somewhat oblique and contracted. From the exterior portion, descending somewhat lower than the rest, a rounded aperture conducts to that part which receives the smelted metal: for this purpose an oval basin exists at the bottom of the furnace, corresponding to which the anterior wall has a conical excavation, which facilitates the taking it out when a sufficient quantity is collected for casting into moulds. The furnace is constructed of clay and its body is proportioned to the degree of heat is must sustain.

The bellows is a very large wooden tube which has externally an octangular form and diameter of 25 inches. It is always made of a single tree, and its construction requires considerable skill and care.

The internal hollow, most finely polished, whose diameter is 17 or 18 inches, admits a corresponding piston (consisting of a thick plank) which is attached to a long handle: by being forced in and drawn out, the air, alternately compressed from either side, is, (by means of two smaller tubes excavated into that side of the ventilator which faces the furnace, gradually narrowing and terminating in the middle) forced into the fire place and a constant blast kept up on the fire. Each of the ventilators is closed by a plank, which has two valves for the admission of the air. To conduct the blast more completely into the heart of the furnace a cylindrical tube of clay is employed, which is attached to the central aperture (or nozzle) of the ventilator, at the junction of the canals which convey the air compressed from each side.

The process of smelting, on account of the heat of the climate, is always performed at night. In the course of the afternoon, the necessary preparations are made. The ore is collected in large heaps in each extremity of the building, and the coals are arranged near both furnaces: 48 large baskets, each containing several bushels, are generally required for one night's smelting at each furnace. The necessary implements consist in several shovels, pokers and ladles.

About an hour before the operation, 3 or 4 baskets of coals are set on fire on the plain before the furnace, so as to be thoroughly ignited at the commencement; in the interval the smelter (who is called Tukán puput) with his assistants, takes a substantial meal on the platform in the extremity of the building, during which they indulge plentifully, drinking an inebriating liquor prepared from rice.

The ignited coals are now thrown into the fire place, which is replenished from time to time from the store in readiness; the ventilators, drawn by three robust Chinese, begin to work, and are kept in motion incessantly till the process of smelting is completed. A quantity of water is collected in large tubs near the furnace, and one of the assistants is employed during the night to dash it over the floor, both for the purpose of cooling the air, and preventing an accumulation of ashes. The coals being thoroughly ignited the ore is thrown, in divided quantities, into the center of the fire place: 6 or 8 shovels full are thrown in at a time, and this is repeated at short intervals without interruption until the process is concluded. In the course of about 15 minutes the melted metal is observed in vivid drops distilling from the lower aperture; its discharge and that of the accompanying dross is assisted by the smelter with a poker. When the furnace is completely ignited a great degree of heat is produced: being properly charged with ore successively thrown on, the metal is observed at intervals flowing in a stream from the lower aperture, which protrudes a flame to a considerable distance attended by a roaring noise.

One of the assistants, in the mean while, forms the moulds in the moistened sand placed in readiness in an oblong excavation near the furnace: and in the course of about four hours a sufficient quantity is generally collected in the basin for filling the moulds: sixteen Ingots are cast at one time; and if the process turns out favourably, the casting is repeated thrice during the night: on an average 44 or 45 Ingots are considered a satisfactory produce from one operation: but several circumstances influence its result. If the ore is very fine, part of it

is elevated by the blast of the furnace and lost, hence the ore is always moistened before smelting: if the particles are coarse they are fused with greater difficulty. The quality of the coals likewise influences the process: this depends in a great degree on the wood from which they are prepared; the best kinds will be pointed out in another place.

The quantity of ore for one night's operation is determined by a Chinese measure called sap. One of these contains 44 catties or $58\frac{87}{100}$ lbs. Troy: ninety measures are generally smelted in one night and yield, on an average, 44 or 45 Ingots. About 7 o'clock in the morning the work is generally finished.

This process answers at once the purpose of roasting and of fusing the ore: in many parts of Bánká, especially at the large mines of Jebus and Klábbet, it is conducted with much method and regularity, and the frequent repetition has given a facility to the workmen: both the furnaces and ventilators appear, in my opinion, well adapted to the purpose; while the large timbers can be obtained the ventilator described will probably remain in use; its construction is expensive and difficult, but it is durable in proportion, and little exposed to accident

All the operations hitherto described, connected with the process of mining and the refining of the metal, are performed almost exclusively by Chinese. The miners, in general, live dispersed through mining districts in the vicinity of the mines, at a greater or less distance from the fixed establishments or dwellings of the superintendants or Kongsies. Besides those persons who are engaged in collecting the ore, various others are connected with the business of the mines, or gain a living from the miners. These live together in a separate village near the chief. Besides Gardeners, Fishermen, Tradesmen, Shopkeepers &c., various artificers are here met with who are indispensible in the process, such as Carpenters, Blacksmiths, Coalburners, and smelters &c. These, during the former administration were supported on a footing somewhat similar to the miners; they took advances in money and necessaries and incurred a debt, the amount of which was deducted from their pay or from the articles they furnished.

Each village also contains a privileged Gambling house, which afforded some revenue to the chief who administered the mine. Gambling being almost the only amusement followed by the miners during the intervals of their labour, it was perhaps too much encouraged by the former administration.

The Chinese preserve on the Island the original character of their nation: industrious, enterprizing and presevering, they are the most useful and important among the inhabitants, as by far the greatest share of mining is performed by them. Most of the Chinese met with on Bánká are born in the mother country, and the increase of population is by no means progressing in proportion to their numbers, which is owing to a great deficiency of females on the Island. Those of them who make a profession of mining possess a considerable share of hardness and independence of character, which is different however in different parts of the Island. The miners of Jebus are particularly celebrated on account of their obstinacy and impudence, and they have several times been riotous. This may be owing in some degree to circumstances; being united in large bodies, they appear to place confidence in their numbers. The miners of Klábbet, Sungie-liat and Máráwáng are apparently more tractable, but they are more divided. In Pángkál-pinang several outrages have been committed in former periods, by the miners in conjunction with the other Chinese inhabitants of the district. They were, in former periods, often treated with great severity by the representatives of the court of Plembáng, whose power was almost unlimited and embraced the lives and properties of the miners. But both the occurrences during the former administration, and the character and numbers of the miners, point out the necessity of supporting those persons who are now charged with the regulation of the mines, by small military detachments proportioned to the existing circumstances.

The conditions of the miners, as far as relates to healthfulness, is upon the whole more tolerable than would be expected from the atmosphere of Bánká. Upon their first arrival strangers are generally attacked by fevers; those who recover enjoy after this, for many years, an exemption from disease. In several of the villages and settlements I remarked, during a continuance of several weeks, no complaints of disease of any kind: but about the autumnal equinox fevers generally appear on the Island. I noticed among the miners several with sore legs and cutaneous eruptions. Their habits and mode of life agree with those of their nation in every part of India. They drink during their work copiously of warm vegetable infusions, and as they cannot generally afford to provide tea, they make a substitute of the dried leaves of the Psidium pyriferum or Gujavos: and large tin kettles filled with this potion are always in readiness in their houses or near their places of labour.

Besides the tin manufactured according to the regular process above described, a small quantity is annually prepared by the mountain-people or original inhabitants. They make a simple cylindrical perforation into the ground, barely sufficient to admit one person, till they arrive at the stratum of the ore, which they take out with the gangue and wash at the nearest stream, without taking the trouble of constructing aqueducts. If they find the stratum productive, they follow it under the soil by horizontal perforations to a considerable distance, and often expose themselves to great danger. Two or three persons generally work in fellowship. In some part of the Island they have adopted the process of small mining followed by the Chinese. The mountain-people of the districts of Sungie-bulu and of Tirák are more in the habit of preparing metal than those of the other districts. Their furnaces are small and their ventilators consist of two small cylinders placed near each other in a vertical position: the pistons being alternately raised and depressed cause a constant blast in the fire-place. As they are obliged to carry their tent a considerable distance on their shoulders, they make the Ingots smaller than the Chinese, their weight is on an average $33\frac{1}{2}$ catties. These people often employ themselves at the extremities of the strata which have been deserted by the Chinese.

The *Malays* follow the regular process of the Chinese in working small mines, but rarely undertake large or kolong mines: in late periods they have rarely been engaged in mining.

The facility with which the ore is collected and the simplicity of the method of mining on Bánká requires, comparatively with other countries, (as has already been mentioned,) little assistance from machinery, and the implements generally employed are neither numerous nor complex. Few artificers are therefore necessary.

Every settlement, however, should be provided according to the extent of the works carried on, with one or more Carpenters and Blacksmiths. And a supply of iron and steel to the miners on moderate terms, must always be considered as of the greatest importance to the interest of those who derive the produce of the mines. The Iron implements in common use are crow-bars, shovels, pick axes and hoes, besides those employed in smelting, as ladles, pokers, &c, these are all made by the Blacksmiths attached to the settlements. Of the wooden machinary employed on Bánká, the construction of the Bellows requires most art and ingenuity, and there are at the present period few workmen on the Island capable of

making it. Its dimensions and application will best appear from a sketch which will be added separately, in conjunction with that of the furnace and the large shed appropriated to the business of smelting.* The mill or wheel for elevating the water with its appurtenances can be constructed by most carpenters: and its application will also be more conveniently represented by a delineation. Besides these, small *wheel-barrows* according to a Chinese model, are generally employed as well at the mines for carrying the ore, after washing, to the furnaces, as for conveying the metal to the stockades and establishments.

The *smelting* of the ore and the *preparation* of the coals, both requiring some habitude and experience, are performed by persons who make a regular profession of the business: the former are known as smelters or *Tukán puput*, the others as coal-burners or *Tukán arráng*. The smelters are paid, according to an established rate, for each night's work, and the coal-burners receive a fixed price for each basket (or pikol) of coals.

Before concluding the account of the mines it may be proper to detail some particulars relating to their private economy during the administration of Plembáng. The Sovereign or Sultan was acknowledged to be the exclusive proprietor of the mines, they were worked only with his consent, and he received a fixed portion of their produce. But the care of administering them was committed to certain officers at the court of Plembáng. These were called Tikus, and were generally charged with every thing relating to the revenues of the Sovereign. As well the duties of their office as their responsibility were of a peculiar nature, but will more properly be pointed out in another place. At the time when Bánká became a British possession, the principal mines were divided among 5 Tikus. *One* administered Jebus, a *second* Klábbet and Sungie-liát, a *third* Pángkál-pináng, a *fourth* Tubuáli Permissáng and Támpeláng, and a *fifth* Máráwáng, and Tirák Belinyu, Lumut &c. Belo were administered by persons of secondary rank.

The Tikus or treasurers above mentioned, in as far as related to Bánká, were invested with the most extensive prerogatives: they were considered as representing the sovereign in their particular districts. No appeal could be made by the miners to the person of the Sultan, and they possessed and exercised the power over the

* This sketch has not been furnished. Ed.

lives and property of the Chinese. Being all persons of the first rank and connections, and charged with various other duties, they generally resided at Pæmbáng, and their affairs on Bánká and at the mines were conducted by their private agents, distinguished by the Chinese denomination of Kongsies, who were vested with authority to regulate every thing relating to the mines and to the persons employed in them.

From a small commencement the administration of the mines had gradually enlarged and extended to a regular economy, connected with a considerable establishment and encumbrance. At each of the principal districts a *stockade* was constructed, according to a plan of greater or less extent and regularity, and proportionally supplied with arms and ammunition: these had become necessary, in late years, in consequence of the frequency and boldness of the attacks of the pirates.

The stockads contained, besides the dwellings of the chief or Kongsy, and of the principal persons belonging to the establihment, storehouses for a supply of necessaries for the miners, for the metal successively prepared, and reservoirs for the machinery and implements not immediately in use. Several of them were laid out according to a more extemsive plan, and contained the dwellings of various artificers attached to the mines, besides those of numerous private families.

Each Kongsy was under the necessity of entertaining an establishment of writers, store-keepers and assistants in the different departments of the mines, proportionate to the extent of the works in his district: he provided likewise from the funds of his employer or Tiko the machinery of various kinds used in mining; besides furnaces, apparatus and implements for the refinement or smelting of the ore. He likewise supported artificers of various kinds necessary in the business of mining, particularly carpenters, blacksmiths, coal-burners and smelters, to each of which was connected a proportionate establishment. A considerable fund was also vested in a supply or store of necessaries which were monthly supplied to the miners, particularly rice, salt, oil and clothing of various kinds.

Whether it was in conformity to along established custom, or whether it was supposed necessary for supporting the particular mode of administration which had been introduced on Bánká, a plan had in late years been adopted and carried to an almost unlimited extent, of granting the miners monthly advances of the articles above

mentioned: these were in general charged at a high rate and afforded a considerable profit to the Tikus.

An idea appears to have prevailed that the debts incurred by these advances were necessary to keep the miners in a degree of dependence, to command their labours at all times, and to prevent desertion or removal from one district to another. This system has indeed been carried to a greater extent in those districts where the miners labour in conjunction in large mines (as in Jebus, Klábbet &c.) and where the aggregate number are responsible for the debts contracted, while in those districts where the miners work in small parties, and on small mines, the produce is easier realized and the habit of contracting large debts, comparatively, less extensive.

The usual monthly advances to the miners consisted in 13 gantangs of *rice* for a single, and 20 gantangs for a married man: (each gantang weighing 4.½ catties Chinese, or 6 pounds Troy.) further 1 catty of *oil* and 1 or more gantangs of *salt*. Each miner also received monthly a small advance in money, which was usually paid in the *tin* coin formerly in circulation.

Besides these advances, which were uniform through the whole island, the miners contracted private debts with the Kongsy, for which they were individually responsible.

One period of the year, the termination of the smelting season, was appointed for regulating the accounts and for liquidating the debts; this was done in the following manner. The quantity of the metal having been accurately determined by weight, a calculation of the amount of its value was made according to the established price. This was done for each mine separately: the miners being considered as united into one body, all those belonging to the same mine shared equally in the produce of the labour.

From this general amount was then deducted:

First, The monthly advances in money and in the necessaries above mentioned:

Secondly, The pay of the smelter and his assistants;

Thirdly, The price of the coals used in refining;

Fourthly, The hire of the furnace and implements;

Fifthly, The amount of the transportation of the metal from the furnace to the stockade, and in some cases, to the landing place at the river.

A balance was then struck, and the remaining sum divided in equal portions among the labourers at a mine. But those who had debts

of a former standing, or who had taken private advances from the Kongsey, were now called on for payment of these out of their individual shares. In most instances therefore the miners received no money in hand, and often the amount of their share was not sufficient for the payment of the old debts, which successively accumulated to an amount that they could never be expected to pay. In this manner those sums have gradually accumulated, which are now found in the books of Kongsies, and which, to use their own phrase, have changed into air. The mode of settlement just described applies chiefly to the large or kolong mines of the western peninsula: in the smaller kolongs of Lumut above mentioned, and in the small mines where one person was the principal, the settlement was necessarily modified, and one miner or chief miner received the amount of the entire produce, in as far as he alone had received advances from the Kongsy.

As in many cases the payment allowed to the miners was not sufficient to induce them to carry on the labour of the mines, a custom was introduced in late periods of granting them *gratuitous advances*, in cases where the collection of the ore was comparatively difficult, in opening new mines, or in the preparatory labour to the business of mining. These gratuitous advances were designated by a Chinese term *Tshu-yap*, which signifies present or gratuity, and they may be considered as private promises or contracts, entered into between the miner and the Kongsy.

The *Tshu-yap* was of very different kinds. In some cases the Kongsy engaged to supply the miners, gratis, with rice (and sometimes with the other necessaries above enumerated) during the period that they were employed in making an aqueduct; in others it was stipulated that the miners should receive the gratuitous supplies from the commencement of their labours at a mine, to the time they had penetrated the earth to the layer containing the ore. In other cases this gratuity was conditional, and the miners engaged to return the advance if the mine proved favourable, but not if deficient in ore.

I have endeavoured at different places to obtain from the books of the Kongsies the annual amount of the gratuitous supplies for a number of ascending years, in order to calculate as near as possible the real price of the tin produced in a certain period of time, but on account of the reasons already mentioned, I have procured only imperfect statements: it must however be taken into considera-

tion in forming an estimate of the price actually paid for this metal during the former administration.

Although the system just detailed contains various abuses, and is far from being applicable to the present state of things, it must be kept in view, in fixing a plan for a more consistent and equitable administration. If we may credit the relations of the old inhabitants these abuses were less extensive in former times, when the Tikos were more true to the interests of the Sultan, who on his part adhered more rigidly to his engagement. But while the mines were productive in the degree above mentioned, in the interval of the years 1750 and 1775, the quantity of Tin manufactured on Bánká exceeded the demands at Batavia, and the surplus was disposed of privately to indemnify the Tikos for the expenses incurred, and often with the connivance of the Sultan. This gradually led to a regular habit of clandestine dealing, which was in later periods carried to a great extent. This must also be considered as having given rise to that custom of granting advances which prevailed so largely on Bánká. Calculating on a liberal profit from the Tin privately disposed of, these advances were indulged to pacify the miners in those cases in which the mines were less productive.

But although these advances were conducted at random and without proper regard to economy, they are in some degree unavoidable, and arise, in a great measure, necessarily from the condition of the Island.

Bánká requires all necessaries of life from other countries, and it therefore becomes an object of consideration with the power which exercises dominion and derives the proceeds of the mines, to supply the inhabitants and particularly the workmen ; in doing which a regulation may be adopted tending to the mutual advantage of him who furnishes and of those who receive the supplies. But it is foreign from the object of the present essay to enter into details on this subject. It is sufficient to remark, in concluding, that by a late regulation, all the duties formerly exercised by the Tikos or by their Agents, the Kongsies, have been entrusted to persons acting on behalf of government, and under the superintendence of the Resident, as Inspectors of the particular districts in which mines are worked. The defects and abuses of the former administration will soon become evident, and point out the necessity and the means of reform. The pirates being removed from the coast and tranquillity and security being established, many of the exiled mountain-people will an-

xiously return to their former residences in the south eastern districts, numerous enterprizing Chinese under the protection of a fostering government, and with the necessary countenance and support, will attempt again the deserted mines or open new ones, and in the course of not many years, a period of prosperity and an increased produce of the mines, may again with confidence be expected from Bánká.

THOMAS HORSFIELD.

NOTE.—This Report was delivered to His Excellency Thomas Stamford Raffles Esq. Lieut. Governor of Java &c., in the year 1814, by Thomas Horsfield.

Library, East India House, August 5th. 1847.

[Menádo and Kímá, which lie directly opposite each other on the west and east sides of the north eastern peninsula of the large and rich island of Celebes, having recently, by a resolution of the Netherlands Indian Government, been proclaimed open to foreign trade from the 1st of next month, the following notices of the Province of Miná hássá in which they lie, will be found interesting.*]

A GLANCE AT MINAHASSA.

By M. A. F. Van Spreeuwenberg.†

General Review.—The capital Menádo is situated on a large and beautiful bay on the west side of the northerly promontory of Celebes, in 1° 30' N. Lat. and 124° 56' East Long. Greenwich, according to the chronometers of the Barque *Sumatra*, (Dec. 1842), according to Horsburgh in 124° 52' East Long., and according to Norrie 125° 0'. Ships anchor in 35 or 40 fathoms at a cable length from the shore, in the vicinity of a good fresh water river.‡ This bay can only be deemed a safe haven during the east monsoon, ships having during west winds a lee shore, but on account of the steepness of the coast ships cannot very easily drive, provided the anchors, cables and chains, are of a proved strength, because driving you are immediately on the shore which consists of a hard sandy ground.

The anchorage is directly opposite the fort, where in the year 1655 Mr. Hustaart erected a wooden fortification, which afterwards

* See the resolution at length, *Singapore Free Press*, 5th October 1848. The preamble declares it to be the desire of the government to give to the productions, the trade and the shipping of the different possessions of Netherlands India that developement for which the condition of each best adapts it, and that this object can be best accomplished, as regards the residency of Menado, by placing it in the immediate, complete and unrestricted enjoyment of the natural advantages which it possesses in its position, fertility of soil, and the industry of its numerous population. It is therefore proclaimed that from the 1st. of January 1849, Menado and Kima shall be free ports, where all goods without distinction, and under whatever flag, may be imported free of duty. Vessels are also to be free from tonnage, an chorage or harbour duties. Strangers are to be permitted to reside at the ports for the prosecution of trade.

† Translated for this Journal from the Tjdshrift voor Neerlands Indie 7 e Y 4 e Deel.

‡ According to Valentyn named *Menangelabo*, but known to the natives by that of *Wenangé*, from a fruit tree which was plentiful here in old times.

was changed under Mr. Fraux in 1673 into a stone fortness named Amsterdam, which name is still bears. In 1703 it was enclosed by a circular stone wall by a sergeant, Henri Duchielz; * afterwards at different times other changes have been made, but the government has not yet succeeded in making a regular work of defence of it.

The garrison, which is stationed in the fort, with the exception of the commander and the doctor who live outside, consist partly of Europeans, and for the remainder of natives. Inside also is the old Residency house, which is now appropriated to the different administrative civil offices, treasury, prison &c.

The place has borrowed its name from the island which is now called *Menado Tuwa*, or *Old Menado;* it was formerly inhabited, but, on account of the continual wars with the princes of *Bolang*, and the want of water, it was abandoned by the population in 1682, when they removed to the continent, and their kampong to the present day is considered as a district and bears this name. But the Alfoers call it, from the name of the river at its outlet, *Wenangé.*

The total subjection of the highlands, dates from 1677, when the East India Company, with the assistance of the king or Sultan of Ternáte, took *Amsterdam* from the prince of Boláng, and drove away the Spaniards from thence.† During nearly two hundred years this coast appears to have alternately belonged to the prince of Boláng and the Sultan of Ternáte; the accounts relating to these changes are very confused.

It appears that in the year 1682 a chief of Boláng was still reigning over all the districts of the so called Mináhássá, with the exception of Amuráng. But, according to the accounts of native traditions which we have collected, which however are without dates, Mináhássá was formerly divided into two parts under the chiefs of Aris and Sonder, named Tololio and Ránton, who were of one family originally from Tonceá, the capital of which is Kemá. This division is now entirely superseded, Mináhássá being divided into 27 districts or, as they were formerly called, *balken* (beams), a designation very old, and originating in the period when we made a requisition for beams to construct our factory and other buildings.

These districts, the soil of which is generally very fertile, and

* Valentyn Old and New East India, vol. I. p, 62.
† Valentyn. Ib. vol. i. p. 62.

which are as it were intersected by volcanic mountains, are placed under christian officers, but are immediately subject to native chiefs who have the ranks of *Major* and *Hukom Bezar*. These districts are Menádo, Aris, Klábbet below, Negerie Báru (Tetewungan,) Bántik, Klábát above (Mumbie,) Liekupáng, Tonceá (Kemá,) Tondáno (Tuliemámbot,) Tondano (Tulián), Rembokán, Kákás, Lángawán, Rátaan, Passan, Belang, Tongsáwáng (Tombátu), Romohon, Tombásián, (Amurang) Tombáririe (Tánáwánko), Támpásso, Kawánkoán, Sonder, Serongsong, Tomohon, Lottá. They are considered to have jointly a population of 84,944 souls.

The christian population, which is not included in the above estimate, probably amounts to 7,388 souls.

Besides the districts above mentioned, there are also under the government of the Resident of Menádo, many places along the coast, such as the Sánger islands, where however our power is very limited.

Monsoons, Rivers and Means of Comunication.

The monsoons agree with those of Java and differ from those of Amboina. During the four past years they have come so irregularly, that it was difficult to say when they really commenced and ended. The South East monsoon having past, we were visited by a very dry wind, which is very prejudicial to vegetation. If the nights are cold the days are so much the hotter, the thermometer (Fah.) ascending above 90° and descending below 64°. For the rest, land and sea breezes are regularly interchanged.

It is said that Menádo was formerly more healthy, but the cause to which this is imputed is very doubtful, viz., that the establishment of cacao plantations produces unhealthiness. Having presently to speak of the temperature of the higher part of the country, what is now said is to be considered as applicable to places along the coast.

The north coast is abundantly provided with rivers, although they are not navigable by vessels of some size. On the south coast they are also met with every where, but, owing to their current being very small during the East monsoon, and the swell of the sea against the coast being then very heavy, they are filled with sea water, and, like those on the north coast, become unfit for the transport of produce. Some of them by meandering through the vallies of the high country, are strongly impregnated with particles of sulphur, and some are even lukewarm.

The roads are placed as suitably as possible, but on account of the country being intersected by mountains and ravines. many of them are not very easy, and great alterations would be required to improve them as means of transport. Although this would be a work of difficulty it is desirable that a commencement should be made.

Although much of the produce is even now transported on horses, the greater part has to be carried by the mountaineers at a great cost of labour and time; sometimes a rupee has to be paid for the carriage of one or two gantangs of rice, and since the cultivators receive in value only 60 cents of a guilder for one gantang, it is easy to see what a heavy loss is entailed upon them.

It would be desirable to introduce the use of carts here, and the greater part of the roads could easily be adapted for them. Even the mountain Impong, which was formerly considered impassable on horseback, has already been crossed by the writer and others with carraiges and horses to and from Tomohon.

For greater exactness we here subjoin a table of the distances between the capitals of the different districts, compiled from the latest survey.

Vegetable Productions.

The vegetable kingdom undoubtedly still presents a wide field for research. We shall however limit ourselves to some subdivisions of this field, the knowledge of which we have gained by experience, and begin with the cacao.

Cacao.—This product is cultivated in the highlands, but mostly on the coasts. The plantations of it are even now considerable, and this branch of industry only requires not to be impeded by any obstacles, in order to be still further extended. It forms a large ingredient in the trade, and furnishes many petty traders with their daily bread, not to speak of the landowners for whom the cultivation of the cacao affords the only subsistence. The preparation of this product here differs from that in the West Indies, and as the writer has some acquaintance with the last, he will make it his first example, in order that by so doing he may also adapt it for the European market. We may reckon that 1,200 to 2,000 piculs of 125 pounds are yearly produced; the prices vary much; being from 50 to 75 florins.

Coffee is an article which must be delivered by the inhabitants to the government exclusively at 12 copper florins per picul of 125

pounds Amsterdam. It is much prized in Netherlands, and it maintains a higher price in the market that the best Java coffee. As the treatment of the product on Java differs wholly from that which is here in vogue, and this in our eyes is much inferior, we know not whether this higher price is ascribable to the name or to an intrinsic superiority in quality. It is certain that this cultivation is susceptible of much improvement, and might be advanced to a much higher condition.

The average harvest is from ten to twelve thousand piculs of 125 Amsterdam pounds, and has, I believe, during the last years rather fallen off than increased, for in a cultivation to stand still is to go back.

Rice.—The oldest notices of Menado which we can trace, shew that this country has always been rich in rice, which in 1671 cost about $7\frac{1}{2}$ rix dollars* the last. At present the government pays 60 cents in cloths for a measure of 40 pounds; that which is sold for the consumption of the inhabitants may be procured at the public warehouse for a guilder the $35\frac{1}{2}$ pounds; and that which is sold for export may be had at public auction for 125 florins the coyan of 3,000 pounds. This product is also capable of extension, chiefly at those places where there are sáwá fields, for example at Tonsáwáng.

A gántáng sowed yields at a minimum 150 fold. But the want of buffaloes remains always a great hindrance, for at present all the work must be done with the potjal or even a stick of ironwood, or of the selo tree.

[From tables given by M. Spreeuwenberg of the quantity of rice delivered from each district from 1st January 1838, to the last of December 1842, and another of the coffee delivered during the same period, it appears that the average annual delivery of rice was 3,390,119 pounds, and that of coffee 1,288,118 pounds.]

Tobacco is cultivated here, but only in sufficient quantity for the consumption of the place. It is exclusively grown by the Bántik population; the mode of preparation is the same as on Java; it is chopped very fine and mostly flavoured with arrack. When bought in large quantities it may be had for 30 cents the pound; but in the *passar* in small quantities it costs double that price. The inhabitants do not use it so extensively as in Java.

* The common rix dollar was 48 stivers: thus 1.92 florins of our money.

Melu or Turkish corn, is a product which precedes each new planting of paddy, cacao, &c., and serves the population as food, particularly when there is a scarcity of rice, after having been bruized fine. Ordinarily it costs 32 cents the gantang or measure of 40 pounds; sometimes it is much dearer. The return is more than 300 fold.

Besides the above there is no other cultivated product of any importance for exportation.

With *fruit trees* the inhabitants formerly took no trouble; we may consider those species which are found here, as indebted for their existence to accident, or it may be to the inclination of some individuals. The Alfúr considers not the profit which the cultivation of such trees would permanently bring him, for he loves to see the fruits of his hand's labour come in to him the same year, in order that they as speedily again may return. Still the species which are found here are numerous, as the mángistan, duríán, six kinds of mángás viz., báchán̄g, dámmer, málákká, dodol, kwinie, dáníng; four kinds of jámbu or gora, viz., red, white, áyer máwár or rosewater, biji, here called gojáwás; lángsá, sweet and pure tomietomie, two kinds of bread fruit amo and gomo, pompelmus not very good, sweet lemons, China apples, limou choei, limou pádáng, with which clothes are washed, limou martin, limou jurpuru for washing the head and making oil, atis or sirikáyá, buá mánoná, different kind of pisáng, anánás, pináng, coconuts, tamarinds only commencing, a few látjen trees also gándáriá.

Those which grow in the woods and are therefore wild, but edible, are palowas, mulberry, brambleberry, pináng, ráuw, pákewà, kelobie, mombongen, káimá, lánsip, kendis, kenilow, bosvá and pápáyá.

Those used in cookery, and which also grow in the jungles, are the kanarie, kemirie, or wiauw, klook or pangie, by us called gallnut.

Timber is in great abundance, some being very well adapted for ship and house building.*

Animals.

Beasts of prey, such as tigers, bears, &c., are not fonnd here, but snakes of different kinds, particularly that called by the inhabitants *Ular patola* (giant or king's snake) on account of his beautifully va-

* A list of 114 kinds of wood follows, which we shall give on another occasion. ED.

riegated skin, are met with of unusual size and in great numbers. Wild cows are also found here, principally in the higher parts of the mountains, but they bear little resemblance to the so called *banting* on Java, are below the middling size, but possess notwithstanding an incredible strength. The Bábí Rusá or deer hog is also found in abundance in the forests. Wild hogs, a great number of kinds of pigeons and other beautifully feathered birds, but no deer, peacocks &c., which render the forests of Java so attractive to the lovers of sport, are found here.

The buffaloe or karbou, the faithful fellow labourer of the Javan, does not exist here, and although an endeavour was formerly made to transplant it from Gorontálo, every attempt failed. The Alfúr is afraid of the buffaloe, and does not know how to manage him, and this possibly is the reason of the want of success; it would, however, be worthy of the trouble to make fresh efforts to introduce this useful animal. Cattle are here in reasonable quantity, and the breeding of them is carried on to an immense extent. Sheep are in less numbers than goats, while the horse studs are extended daily more and more. Horses and mares are constantly brought from Gorontálo* and are sold in the high countries for 35 to 40 guilders, that is those of inferior breed; those which are well made and of a good size cost 100 guilders and more. The writer has seen horses brought from Gorontálo run up as high as 200 guilders, and considering that they entail no expence on the inhabitants, it may be predicted that Menádo will very soon be fully provided with horses, which will greatly assist the population in the export of produce. Hogs are amongst the chief breeds of the Alfúrs. Their price is moderate and in some places cheap. Poultry, as fowls, ducks, geese, although not abundant, may yet be had at moderate prices. The annual mortality amongst the poultry occasions much scarcity, because it happens frequently that you loose all your poultry in two or three days, and sometimes even in one night. The old inhabitants say that in former times sea fish of different species abounded, and were procurable at moderate prices. For some yerrs the take has remarkably decreased. They say the reason is that from the multiplied fishings by the *pukat* or *soma* (dragnet) the fishes have been rendered shy, and now frequent those places along the coast where they are not

* That the horses are not aboriginal here, appears sufficiently from the Portuguese name which has been given to them viz., Cawalo, or cawayo. The Alfúrs have no name for them in their own language.

disturbed. They also accuse the Bántikkers of from time to time casting into the sea a certain root, *borie*, which causes an irritation in the eyes of the fish, and also a fruit called *eanta* which stupifies the fish and makes them rise to the surface where they are easily taken. This stupifaction does not spoil the fish and they remain good for eating.

There are also procured very good river fish, shrimps, eels, crabs and lobsters. The purse-crab or so called *katang kanarie* comes from the Sángir islands. Cabos, gètegète &c., although we can from time to time procure them, belong more to the highlands. The tuturuga or tortoise is also found here ; they are mostly brought in by the orang *Badjo*.

An Excursion in Minahassa.

On the 9th. of August, 1842, Mnrs. Van Dieman and Moraux, the agents in the Moluccas of the Netherlands *Handelmaatschappy*, and the writer, on horseback, and the wife and two daughters of the latter in chairs, made a journey from Menádo to the highlands of this Residency. The party very early reached the negory Lotta, situated 6 miles from the capital at the northern foot of the mountain Impong, and elevated a considerable height above the level of the sea. There is nothing very remarkable in this small village, save in its possessing the dwelling house of the Hukom Besar (District head) which is still built after the old Alfuran style of architecture, and distinguished by its dirtiness. It might be supposed that the negoris in the vicinity of the capital would be advanced in civilization much further than their neighbours in the more distant districts, and that the inhabitants, acquainted with our customs from an earlier period, would gradually have acquired them. The contrary however is the fact; and in the sequel we shall find that many good and beautiful things are to be found in the interior, of which we should in vain seek the traces in the capital Menado.

From the negory Lotta we commenced to ascend the mountain Impong, which has a height of 3000 feet. From one point on this road we have a magnificent view over the bay of Menádo, Menádo Tuah, and the islands which form the Straits of Bánká. In other respects the journey is monotonous, and in the rainy season, particularly when a large quantity of produce is brought down, it is nearly impassible.*

* The road has now been altered and improved.

Descending from mount Impong, we come into an extensive plain bordered by high mountains. About 11 o'clock we were with the missionary Matern at Tomohon. For us, who had come from a climate at bloodheat, the change was most agreeable, for the thermometer shewed a temperature of 76° Fah.

The dwelling of Mr. Matern is situated most agreeably, and is of a spacious construction. From the back gallery in particular we have a delightful view of the mountain Lokon, 5052 feet, Impong, and Máháwú 4197 feet, above the level of the sea. Lokon and Máwáhú are both extinct craters. Tomohon itself lies about 2000 feet above the level of the sea.

Having, at the commencement of our journey, formed the resolution of seeing whatever was remarkable, our excursion to the lake Lienong, situated near the negory Láhendong, deserves to be first noticed. Half way between Sárongsong and Láhendong, we already observed on the road the sulphur exuding from the ground, and on the left, several sulphureous marshes. Every thing here is barren and rude, and nature waste and inhospitable. We speedily reached the height at the back of negory Láhendong, where we dismounted to consider more at our ease all the splended objects which present themselves to our eyes. It is a glorious view. Turning to the west you behold, on both sides of the mountain Korey, the sea in the distance,—on the right, Lakon exposing its full dimensions,—at your feet the negory Láhendong,—at your back lake Lienong about half a mile in circumference, formed by the mountains Tolánko, Lingkoan, Kásurátán,—and Tempusu below you. The glittering of the waters of the lake beneath is exceedingly beautiful, shewing, from the volcanic action, different colours. On the sides and at your feet you see the sulphur and the hot water boiling up from the ground, the last at a heat of 200° to 202° Fah. so that in 2 minutes an egg may be boiled in it. Two prahus of hollowed trees bound to each other served us as a raft to reach the other side of the lake, where the aspect of nature is of a more terrific character. Here also the hot water runs from the walls and shore into the lake, but it is of a lower temperature than that on the other side. A boiling sulphur pool, thirty feet in diameter, first arrests your attention. It has a temperature of 140° Fah. while all around and under you there is nothing but desolation and boiling water. It is necessary to be careful if you wish to exted your researches further up than the ordinary road. An experienced guide is indispensibly required, as this is the place where the Count

de Vidua lost his life in his zeal for exploration. Not listening to the advice of the natives around him, he fell into the boiling mud.*

The sulphur vapour prevented us from remaining long here. Conducted by persons who knew the country, we observed over some trees and low underwood, different places where the mud boiled up, It was remarkable that in the circumference of 30 or 40 feet different degrees of heat were found, 135°, 171°, 145, and lower, 165°. It was also very remarkable that the volcanic direction near this lake was east and west, and that the earthquakes there are felt in the same direction.

The lake, which is 10 feet deep, has an outlet through the district Sonder, and near the negory Tinji forms one of the most beautiful cascades yet known here. But, that we may not anticipate our narrative, we will return to this afterwards.

In the lake Lienong, six different kinds of fish are found, viz., cabos, gètegète, sayo, lumulontik, komo and the largest kind of eels, and also a number of wild ducks and other water fowl. At noon the thermometer was 75° Fah. Through Sarongsong we went back to Tomohon.

On the morning of the 13th. we were again in the saddle to go to Tondáno, Mr Matern accompanying us. The distance from Tomohon to Tondáno is only seven miles, and furnishes little worth notice, only some abandoned coffee gardens and two hot springs called Tátaärán; our thermometer being broken, we could not ascertain the degree of heat, but we plainly perceived that the water was not so hot as that of Lienong.

Tondáno is one of the largest negorys of Mináhássá, and is governed by two Majors, viz., those of Tuhán and Tuliemámbot; these two divisions of the negory are separated by a river, which takes its rise in a large lake. In the middle of this river is a small island on which a house is built. This was formerly the Loge, but is now the residence of the officer Constans. This island is joined to both sides of the negory by bridges. In consequence of both the Majors of Tondáno being christians, I believe that most of the baptized Alfúrs are found here. A fine church and a roomy school house adorn the negory. The best carpenters come from this part, and are almost exclusively employed in the lower country. Hence there is a greater appearance of prosperity amongst the population than in any other place. Right opposite the Loge of Tuhán a market is

* See Tjd. voor N. I. 5th. 1 deel 1. blz. 306.

kept, which reminds us of some parts of Java, although this resemblance does not go very far, as little save barter is carried on. The articles exposed are baskets of a certain size filled with paddy, cabos salt, vegetables &c. With money scarcely anything can be purchased. From far and near people come here to barter one thing for another. Sometimes an exchange is made without a single word passing. Perhaps some person has salt and wants fish. He selects some fish and places its value in salt, according to his estimate, beside it. The owner of the fish does not look at him and remains silent. The other now adds more salt by little and little until, at last, the owner of the fish pushes the fish to him, and takes possession of the salt, and the transaction is concluded.

Amongst the remarkable things at Tondáno are the famous cascade and the lake. Accompanied by the Major of Tuliemámbot, we walked to the first which, going and coming, may be considered a good walk. At a considerable distance we hear the continued rush of the water. When we arrive at the pondoppo, which is situated at the side of the ravine, and see the roaring water falling below with a thundering crash, the scene becomes magnificent. The real fall, that is to say so far as the water falls without encountering any obstacle, is about sixty feet. Properly it commences higher up, but is there broken and forms another fall, whence it rushes to the true fall. The spot on the small bridge above the river where the second fall commences is appalling. You feel an irresistable shuddering and notwithstanding the spars on which you stand have proved their strength, you fear every moment that they will be loosened, the inevitable consequence of which would be that you would be at once crushed. At the first fall, some tree trunks, as thick as a man's waist, were thrown into the water, but the eye in vain tried to follow them in their course, and we could see nothing more of them after their fall. It sometimes happens that small prahus, from carelessness, get adrift in the negory above and are brought by the current towards the fall, when nothing more is ever seen of them. In the ravine the fall forms a basin, across which, although it is very slippery, you can run. Formerly on both sides of the precipice there hung ladders of rattan by which you could descend below. This fall is the commencement of the river which runs into the sea at the capital Menádo.

On our return we went to visit the notorious Kiay Modjo, the head priest of Diepo Negoro. He is small and of mean appearance,

but is distinguished by a sharp eye and a rapid manner of speaking, which indicate the passion and fire of his soul. Our visit did not seem to be disagreeable to him, particularly when he heard that we were acquainted with his fellow revolutionists, who are now in the Vorstenlanden (Princeslands) in the service of government. He had still a lively recollection of many of the chief functionaries. His dwelling, like that of the other Javanese, of whom 70 to 80 reside here, has not thing remarkable in it, and is built in the Javanese manner, that is to say on the ground, surrounded by a fence of bambu and covered with áláng áláng. Within the limits of their dessa are their sáwá fields, and around their dwellings small vegetable gardens, while a great number of them maintain themselves by petty trading. They produce also very good potatoes, *kachang tana* &c. There is no doubt that they will form a new race in Minahássá, because they continue to adhere to the Mahomedan faith, and extend it by marriage with Alfúr women, who must first adopt their religion.

The district Tondano is surrounded by fine sawa fields. It is to be regretted that all the labour is performed by the hand, and not by the plough and harrow. We have already spoken of the coffee gardens. The fishing also furnishes a large branch of subsistence for the Tondanese. In the morning the thermometer (Fah.) stood at 67°.

Before our departure we invited the principal heads with their wives to dinner, together with the missionary Riedel living there, so that at table we mustered 30 persons.

On the 19th. of August we went in two sloops across the lake Tondáno to Rembokán, for on this water, which is situated 2000 feet above the level of the sea, there are capital boats built by an Englishman, Mr. Davis. It is generally believed that this lake, which is 3 leagues in length, and $\frac{1}{3}$d to 1 league in breadth, is of volcanic origin. In the centre is the real spring where the water continually bubbles up from the ground. This, with the water that is supplied by the streams near *Kákás*, and those, 31 in number, which again feed the latter, form the river Tondáno and its cascade. The lake has a variable depth of 90 to 100 feet and the inhabitants assert that there is a place between Kákás and Rembokán which is bottomless, and to which they attach a particular superstition.

On the shore of this lake are situated the following dessas. Departing from Tondáno on the right hand there are Rembokán, Pásso

and Kákás on the left, Túhán Kitjili, Tándengánlámbot, Wátú Merá and Eris. Except the chief districts, which we have named, the others are of little importance. Túhán Ketjili alone is worthy of a visit, from the beautiful view which we have there over the lake in clear weather. It is celebrated for its pleasant cocoanut water. The lake is also rich in cabos, gètegète, eels and garnals. By pulling strongly, and when the wind is not unfavourable, it is possible to cross it in an hour and a half, but with adverse winds five hours are sometimes requisite. The high swell renders the voyage a little troublesome, because there is a resistance which renders the passage occasionally dangerous.

Rembokán is situated on the shore of the lake, and is not an unimportant dessa. It is covered with stones of which tradition tells some strange things. At the time when the mount Máháwú and those of Tongsáwáng and Sepután were still in full volcanic activity, the god of Impong, who was also a smith by profession, being at one time in want of coal, sent one of his servants to search for it. But in this he was hindered by the god Sepután, who aware of it, sent one of his servants to wait for him on the road, in order to prevent his succeeding in his enterprize. This servant concealed himself on the height of Rembokán behind a tree, and when the other arrived with his burden of coal, he frightened him so much that he let his coals fall and took to flight. Hence the numerous stones at Rembokán into which the coals have been changed. From this we see that the superstition, and fondness for the supernatural, which characterise so many people of the Archipelago, also characterise the Alfurs. Then they believe that the whole world (probably Rembokán) rests on a great hog, and that when this hog rubs itself against a tree, the earthquakes are produced.

Pulling from Rembokán to Kákás we passed the negory Pásso where there are two hot springs, and a little further on another opposite the adjacent mountain. We had an opportunity of seeing the last on an excursion which we made to it from Kákás. That which lies on the road has at the first glance much resemblance to the spring of Tátáárán, and it is said to possess a strong sanative power.

Arriving at Kákás we took up our abode at the lodge, and were received by the wife of the Major and by a Húkom, because the Major himself was from home, being engaged at the new road over the Impong. The lodge is one of the most beautiful buildings in the whole of Menádo. It is situated pleasantly on the lake, and from

the verandah behind we have a view of the whole town, which runs in straight streets.

On the 22nd August, we prosecuted our journey from Kákás to Lángowán, situated 4 miles from Kákás, to which it is joined by an even and good road.

Lángowán is no inconsiderable village, although there is no church and the schoolhouse has a mean appearance. Mr. Schwartz resides here as missionary. Amongst the remarkable objects may be mentioned two hot springs and a number of boiling mud wells. The first hot well is approximately 7 fathoms in diameter, has a heat of 165°, and contains much sulphur, the exhalations of which are injurious to the breath; the water which we drank has the taste of rotten eggs. The water which runs from the well retained in its petrified channel a heat of 151°

From thence we proceeded higher and came to the hill Tompáng. As we climbed somewhat to the left of the road, we had a striking view. In the north and south smile two beautiful vallies, which in clear weather present a true panorama. The mountains Káwáták, and Pompelempungan, and the mountain pass by which Boláng is reached, shew themselves to the west, while the eye, lingering on the fields cultivated by the people of Káwánkoán and Rembokán, rests at last on the mountain Pelotán.

At the foot of the hill there is also a hot water spring, but as our thermometer was broken here we could not ascertain the temperature. It appeared to us however that it was higher than that of the springs previously mentioned. It lies concealed deep in the forest, and we would not have been able to see it if Mr. Schwartz had not been acquainted with it, for the Major declared that it was inaccessible. Judging from what we heard, we must attribute this reserve to superstition, and a fear of the trouble which would be occasioned to the inhabitants by waiting on persons visiting the place from curiosity. This indeed was once the case with the small lake of Tálátáp, which lies a good half mile below the great mother spring. The water of this lake was rapid at the side, and is said to contain fish.

Ascending further from the hill of Tompáng we came to some boiling mud springs, which throw up a whitish earth, and are unfathomably deep.

Of more importance is the great mother pool, which lies to the left of the first mentioned warm spring, and from which we can by an inner road reach Lángowán, and so avoid the necessity of taking

the same way back. Here everything is volcanic, and the ground on which we stand is tolerably warm; almost everywhere if we bore with a bambu stick in the ground, the boiling mud appears. Several of these springs make an uncommon noise. They appear to shift, or rather they dry up in proportion as they boil out and the volcanic ingredients of the earth are consumed and turned into a kind of pipeclay; for we have walked round some places which at a previous time, on the first tour of inspection of Gøvernor de Steurs, could not be approached. This pipeclay is very fine, and is commonly used for white washing houses.

After the worthy missionary Schwartz had shewn us every thing, it was time for us to proceed, however willingly we would have prolonged our stay. On the 26th August, we took leave of him, while the Major, Captain, their wives, with some other notable native ladies, accompanied us on horseback to Tompásso.

Tompásso is about 5 miles distant from Lángowán, and is a pretty though not large village. There is a Major as head of the District, and we found here a very neat Loge. But as there is nothing particular that requires mention, and we remained only a brief space, we shall continue the narrative of our journey. We proceeded two miles on to Kowánkoán where the heads of Tompásso took their leave of us. We next reached Sonder, the Loge of which is one of the first that was erected in Mináhássá. The Major of this place H. W. Dotulong, who was engaged in the Javanese war, had thereby been made more free in his intercourse with Europeans. To the satisfaction of us all, he made known to us a water fall which he had discovered and which no European had hitherto visited. It takes its origin from the lake Lienong, and forms itself about a mile north of the negory Tintjep, which lies seven miles from Sonder. If the appearance was fearful which this mass of water exhibited when, from a distance, we saw it leaping down, it was yet more imposing when, after a very difficult effort, we found ourselves at the basin of the fall. Thundering and with a deafening roar falls a stream of about three fathoms broad and fifteen fathoms in height, between rocky masses which perhaps for ages have withstood the force of this descending flood. The falling water reminded us by its foam of large snow wreathes in Europe, and partially lost itself, all broken and foamy, in a thick mist which, born up by the wind, returned to the element from which it was born. Rainbows are occasionally formed both in the water in the basin, and on that of the fall itself.

This fall in our opinion is much more imposing than that of Tondáno, for it plunges at once perpendicularly down without meeting with any obstacle; then twisting like a snake within its massive rock walls beneath, it forms a second fall, and disappears in an inaccessible forest.

Besides this there are other two waterfalls in the vicinity of Sonder.

An excursion to Káwánkoán made a great change in the plan of our journey. With the map of Mináhássá before us, we saw that we could very well go along the volcano Sepután to Tombátu, the capital of the district of Tongsáwán, and would save a great part of the journey yet to be accomplished, if we proceeded by Amuráng. The inhabitants not only opposed this, but declared that it was impossible, particularly as we intended to make the journey with horses which to their certainty had never been brought there. But, acquainted with their difficulties, we stood fast to our determination.

On the 12th. of September we proceede dacross the negory Tompássá, and from thence to the foot of the mountain Sempo where we were obliged to dismount, as the horses could not pursue the path further.

Hitherto our course had lain higher and higher through a thick wood. Different species of trees raised their heads magnificently, for the greedy hand of man had not reached here. The great age to which these trees must have attained is not to be reckoned. Climbing on, we entered at last into a cold mist which made our teeth chatter, and came near enough to a new year's fog in Europe; arrived on the summit of the mountain Sempo we could not distinguish objects at 10 paces off. We took refuge in a small hut erected for us which was very open; a bambu table and stools and a similar couch formed our furniture.

The Major of Káwánkoán told us that during the earthquake which had formerly happened, all the people who were working here fled below from fear that the mountain might begin to labour.

To keep ourselves in motion we walked to the right and left on a dry flat, while the dense mist prevented us seeing to any distance. But what an impressive image of desolation and force met the eye when it cleared up. As far as vision could reach nothing was to be seen but a dry sandy desert, the ground being formed of lava and having much resemblance to the ashes of burnt coal, and on which only small bushes of kusu-kusu or káno káno (two kinds af grass) grew

here and there. It is the crater Ráno Assem. It is all a congeries of vallies, or basin formed hollows, probably formed in the manner of tunnels in proportion as the volcanic action has consumed and heaved up the ground under the surface of the earth. We find here no signs of living things, except wild cows, whose traces are so abundant that at one place we lost the direction of the proper path.

Shuddering we approached this chaos of desolation. At some distance from the margin of the crater we began to creep that so doing or lying, we might in safety receive the full impression of all the terrible but also grotesque characteristics of this work of nature. A noise struck our ears much resembling that of the opening of the valve of the pipe in a steamboat, and which can be heard at a great distance. It was the sulphur pool at the bottom of the crater.

At first the sulphureous vapour hindered us from distinguishing objects, but after half an hour, the vapour was driven off by the wind, and the whole basin lay exposed before us. The first impression was fearful. A boiling sulphur pool of about 500 feet in diameter is enclosed by steep rocky walls, from which the sulphur apparently comes, and which, some perpendicular like columns others like arches, threaten to fall with you in a moment below, while the sides (a kind of stone burnt and changed into lime) at the slightest unwary touch crumble away.

We endeavoured to cast stones into the middle of the crater. For this purpose we fastened a tolerably heavy stone to the end of a rope of about 110 fathoms long, and threw it forward but the rope ran out to 100 fathoms without the stone reaching the pool.

We saw no living beings save some swallows which wheeled above the pool. We also observed traces of wild cows which had descended into the crater; what they seek there is a mystery, for neither in the crater nor in the vicinity is a single blade of grass to be found.

We passed the night on the top of this mountain, which according to Professor Reinwardt is 4744 R. feet and according to Mr. Forsten 5126 Fr. feet in height. The cold was piercing, for the plain being quite open the wind and mist passed over it unimpeded. At sunrise the thermometer stood at 60° F. The atmosphere was now clear, and we saw the negorys Káwánkoán, Tompásso, Lánguán and Kápás in miniature, with the lake of Tondáno lying before them. All the hot springs and boiling mud pools which we had visited were in our eye, now so many steam pipes, while we saw over the mountain Pompelempungán the islands and the sea on the south coast in

front of Boláng, and on the north coast the bay of Amuráng and the island of Menádo Tuá, a pánoráma which the pencil only, and not the pen, can depict. The variety is so great and striking that we remained chained to the place where we stood.

After having thus visited Ráno Assem, we followed our way along the cone of the still active craters, but to reach it we had to be carried, because it was impossible to take our horses. Having once reached the top, which is 50 feet higher than Ráno Assem, we did nothing but descend and finally came to the foot of the cone. In climbing this mountain it happened often that our bearers instead of advancing went back, because they could not get a firm footing amongst the soft stones. The foot and all the back of the mountain is strewed with immense clusters of rocks which have been ejected from the crater, and we are amazed at the force which must have attended such eruptions, for 10,000 men could not move, much less transport, some of these rocks.

We may here introduce a table of the heights of the different high mountains in the Moluccas,* ascertained by Professor Reinwardt in 1821.

	R. feet.
Gunong Api in Bándá, ...	1,646
Mount Sápin, ...	629
Nount Bándérá, ...	1,549
The east rim of the crater of Ternáté, ..	5,404
The highest point of the mountain Tídoré, ..	5,435

MENADO.

The negory Kákáskássen, ...	2,589
The mountain Lokon, ...	5,052
Negory Tomohon, ...	2,413
Rim of the crater Máháwu	4,197
Negory Tondáno, ...	2,096
Mount Sèmpo, ...	4,744
Seputan, rim of the crater, ...	5,570
Klábát, ...	6,133

We believe that the later estimates of Mr. F. A. Forsten, differ a little from these.

At a height of about 4000 feet we mounted our horses again, although they had much difficulty in proceeding owing to the hard gravel.

* The Residency of Menado is a dependency of the Molucca government. —ED.

From here we went on over a dry and naked plain, strewed with stones, between the mountain Sepután and Sempo. and descended along a path quite unconfined until we came to a thick wood, through which we pursued our way with as much speed as possible. It presented nothing worth remark save a number of aren and other thick trees peopled with legions of black apes. At two o'clock we arrived at Tombátu.

This negory, which is not very extensive, is surrounded by lakes and sawa fields, rice being the only cultivation followed by the inhabitants, who are far behind the population of other districts in civilization. They will long remain in the same state, because they will not abandon their old customs. Poverty is general, but their wants being few they do not feel it, and although they have the means of cultivating other necessaries, sago remains the delicacy which they most prize.

The mode in which the houses are built differs wholly from that of the other districts. They are placed twenty and sometimes more feet above the ground on thick posts; some are 15 to 20 fathoms long and 8 fathoms broad, while in one of such houses sometimes 15 or 16 to 20 hearths or households are united. Allowing for each household five souls, we have 70 to 80 men swarming in one of these houses. Each household has its apartment and its dápor or cooking place, from which the custom has arisen of enumerating the population by dápors. The same custom prevails all over Mináhássá, just as in Borneo this is done by kettles (kwántángs) in which the rice for each household is cooked. Cleanliness is a word not yet known in the Tongsáwáng language; beneath the houses all the household work is done, and the same place serves for the accomodation of the pigs and also sometimes of the dead.

Messr. van Diemen and Moraux made an excursion from here to Boláng, which lies 16 miles off on the east coast. The way is over acclivities and hollows, and from its sandiness very difficult. They found a fine loge and a more civilized population, chiefly employed in taking fish and digging for gold. Formerly this was the permanent residence of the superintendent of this division, but as it is very unhealthy and the Boláng fever very dangerous, he removed to Tondáno when it was also placed under him.

From Tombátu to Amuráng is a distance of 16 miles; the road, when rain has not fallen, is most difficult, as we sink to the ankle in the soft sand. It is monotonous, for we ride through a thick

wood of aren and other trees, so that the eye is shut in right and left. At one o'clock we arrived at Amurâng. It is a large kâmpong, divided into straight streets, the population consists of 1,000 christians and 2,000 Alfurs; there is a fine loge and church roofed with tiles, and a large school house. The fortalice is in a very decayed state, and not calculated in our opinion to be of much service. There is nothing else at Amurâng remarkable save the ropery where Gumutí twine is prepared, but of small size, because the thicker kind is made at Kemá. On an excursion to the negory Romohon we went to visit this also: on our arrival the yarns were being spun and in three quarters of an hour a coil of 120 fathoms was made. The work is fatigueing, but the inhabitants get through it rapidly. This ropery, like that at Kemá, is a government undertaking; the people furnish the gumutí yarn in commutation of a tax, while the workmen are paid by the ropery.

The Superintendent at Amurâng told us that in the sea a hot spring is found; but the coast not being free from pirates we did not go to visit it.

From here we took our way homeward through Táná Wánko. For nine miles the road is very even, till we reach the foot of the mountain Monte in the Dessá Leler, where it becomes very steep and in the rainy season must be almost impassible on horseback. At Monte we changed our horses, which was very necessary, since the whole way to Ráno Wánko, a negory close by Táná Wánko, is not one of the easiest, and in riding along the beach we had to struggle with large rocks and stones.

The next day was occupied in travelling through Tátelie to Menádo where we arrived at half past 11 o'clock in the forenoon, after an absence of 30 days and well satisfied with our journey.

*** We have taken some liberties with the arrangement of the preceding paper, our object having been to enable the reader to gather from it some general idea of the characteristics and capabilities of a rich and promising province of Celebes, about to be opened to British trade. M. Spreeuwenberg's account of the inhabitants we shall give in a future number. We cannot at present offer any information respecting the trade of the country. Count Hogendorp, in his Coup d' Oeil sur l' Isle de Java, (1830) states, that "of the two northern districts of Celebes, which are under the governor of the Moluccas, Menádo and Gorontálo (Gunong Tello), the former be-

The distance. To / From.	Menado.	Aris.	Klabat below.	Negrie Baroe.	Batik.	Klabat above.	Liekupang.	Toncea Kema.	Tondano Tulimbt.	Tondano Tulian.	Rembokan.	Kakas.	Languwan.	Rataän.	Passan Wawalie.	Belang.	Tonsawang.	Romohon Amurang.	Tombasian. ,,	Tombaririe Tanaw.	Tompasso.	Kawankoan.	Sonder.	Serongsong.	Tomohon.	Lotta.
Menado.				1		6	24	22	22	22	23	28	32	42	46	51	53	$37\frac{1}{2}$	37	16	29	27	25	16	15	$6\frac{3}{4}$
Aris.				1		6	24	22	22	22	23	28	32	42	46	51	53	$37\frac{1}{2}$	37	16	29	27	25	16	15	$6\frac{3}{4}$
Klabat below.				1		6	24	22	22	22	23	28	32	42	46	51	53	$37\frac{1}{2}$	37	16	29	27	25	16	15	$6\frac{3}{4}$
Negrie Baru.					$1\frac{1}{4}$	7	25	23	21	21	22	27	31	41	45	50	52	$36\frac{1}{2}$	36	15	28	26	24	15	14	$5\frac{3}{4}$
Bantik.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{2}$		$5\frac{1}{2}$	$23\frac{1}{2}$	$21\frac{1}{2}$	$22\frac{1}{2}$	$22\frac{1}{2}$	$23\frac{1}{2}$	$28\frac{1}{2}$	$32\frac{1}{2}$	$42\frac{1}{2}$	$46\frac{1}{2}$	$51\frac{1}{2}$	$53\frac{1}{2}$	38	$37\frac{1}{2}$	$16\frac{1}{2}$	$29\frac{1}{2}$	$27\frac{1}{2}$	$25\frac{1}{2}$	$16\frac{1}{2}$	$15\frac{1}{2}$	$7\frac{1}{2}$
Klabat above.	6	6	6	7	$5\frac{1}{2}$		21	16	28	28	28	33	37	47	52	56	58	$42\frac{1}{2}$	42	31	35	32	30	21	20	$11\frac{3}{4}$
Liekupang.	24	24	24	25	$23\frac{1}{2}$	21		29	33	33	40	45	49	59	63	68	72	$61\frac{1}{2}$	61	40	53	51	49	40	39	$30\frac{1}{2}$
Toncea Kema.	22	22	22	23	$21\frac{1}{2}$	16	29		20	20	27	32	36	46	50	55	69	$59\frac{1}{2}$	59	38	41	39	37	28	27	$28\frac{1}{2}$
Tondano Tulimbt.	22	22	22	21	$22\frac{1}{2}$	20	33	20			7	16	16	26	30	35	49	$45\frac{1}{2}$	45	22	21	19	17	8	7	$15\frac{1}{2}$
Tondano Tulian.	22	22	22	21	$22\frac{1}{2}$	20	33	20			7	16	16	26	30	35	49	$45\frac{1}{2}$	45	22	21	19	17	8	7	$15\frac{1}{2}$
Rembokan.	23	23	23	22	$23\frac{1}{2}$	28	40	27	7	7		5	9	19	23	28	42	$38\frac{1}{2}$	38	23	14	16	18	9	8	$16\frac{1}{2}$
Kakas.	28	28	28	27	$28\frac{1}{2}$	33	45	32	12	12	5		4	14	18	23	37	$33\frac{1}{2}$	33	28	9	11	13	14	13	$21\frac{1}{2}$
Languwan.	28	32	32	31	$32\frac{1}{2}$	37	49	36	16	16	9	4		10	14	19	33	$29\frac{1}{2}$	29	34	5	7	9	18	17	$25\frac{1}{4}$
Rataän.	42	42	42	41	$42\frac{1}{2}$	47	59	46	26	26	19	14	10		4	9	23	$39\frac{1}{2}$	39	44	15	17	19	28	27	$35\frac{1}{4}$
Passan Wawalie.	46	46	46	45	$46\frac{1}{2}$	51	63	50	30	30	23	18	14	4		5	19	$35\frac{1}{2}$	35	48	19	21	23	32	31	$39\frac{1}{4}$
Belang.	51	51	51	50	$51\frac{1}{4}$	56	68	55	35	35	28	23	19	9	5		14	$30\frac{1}{2}$	30	51	24	26	28	37	36	$44\frac{1}{4}$
Tonsawang.	53	53	53	52	$53\frac{1}{2}$	58	72	69	49	49	42	37	33	33	19	14		$16\frac{1}{2}$	16	37	38	38	40	49	50	$56\frac{1}{4}$
Romohon Amurang.	$37\frac{1}{2}$	$37\frac{1}{2}$	$37\frac{1}{2}$	$36\frac{1}{2}$	38	$42\frac{1}{2}$	$61\frac{1}{2}$	$59\frac{1}{2}$	$45\frac{1}{2}$	$45\frac{1}{2}$	$38\frac{1}{2}$	$33\frac{1}{2}$	$29\frac{1}{2}$	$39\frac{1}{2}$	$30\frac{1}{2}$	$30\frac{1}{2}$	$16\frac{1}{2}$		$\frac{1}{2}$	$21\frac{1}{2}$	$22\frac{1}{2}$	$24\frac{1}{2}$	$24\frac{1}{2}$	$33\frac{1}{2}$	$34\frac{1}{2}$	$42\frac{3}{4}$
Tombasian ,,	37	37	37	36	$37\frac{1}{2}$	42	61	59	45	45	38	33	29	39	30	30	16	$\frac{1}{2}$		21	22	24	24	33	34	42
Tombaririe Tanaw.	16	16	16	15	$16\frac{1}{2}$	21	40	38	22	22	23	27	34	44	48	51	37	$21\frac{1}{2}$	21		29	27	25	16	15	$22\frac{3}{4}$
Tompasso.	29	29	29	28	$29\frac{1}{2}$	34	53	41	21	21	14	9	5	15	19	24	38	$24\frac{1}{2}$	24	29		2	4	13	14	$22\frac{1}{4}$
Kawankoan.	27	27	27	26	$27\frac{1}{2}$	32	51	39	19	19	16	11	7	17	21	26	38	$22\frac{1}{2}$	22	27	2		2	11	12	$20\frac{1}{4}$
Sonder.	25	25	25	24	$25\frac{1}{2}$	30	49	37	17	17	18	13	9	19	23	28	40	$24\frac{1}{2}$	24	25	4	2		9	10	$18\frac{1}{4}$
Serongsong.	16	16	16	15	$16\frac{1}{2}$	21	40	28	8	8	9	19	18	28	32	37	51	$33\frac{1}{2}$	33	16	13	11	9		1	$9\frac{1}{4}$
Tomohon.	15	15	15	14	$15\frac{1}{2}$	20	39	27	7	7	8	13	17	27	31	36	50	$34\frac{1}{2}$	34	15	14	12	10	1		$8\frac{1}{4}$
Lotta.	$6\frac{3}{4}$	$6\frac{3}{4}$	$6\frac{3}{4}$	$5\frac{3}{4}$	$7\frac{1}{4}$	12	$30\frac{3}{4}$	$28\frac{3}{4}$	$15\frac{1}{2}$	$15\frac{1}{2}$	$16\frac{1}{4}$	$21\frac{1}{2}$	$25\frac{1}{4}$	$35\frac{1}{4}$	$39\frac{1}{4}$	$44\frac{1}{4}$	$48\frac{1}{4}$	$44\frac{1}{4}$	$43\frac{3}{4}$	$22\frac{3}{4}$	$21\frac{1}{4}$	$20\frac{1}{4}$	$18\frac{1}{4}$	$9\frac{1}{4}$	$8\frac{1}{4}$	

longs to the Dutch in full sovereignty, while the latter has a Sultan who is a vassal of the Dutch government. They produce coffee, rice, gold, and furnish excellent cordage of Gomuti. Civilization and industry have made great progress in these districts during the last fifteen years. The cordage above mentioned, which is manufactured at Kemá, is of very great utility for ships; the purchase of this article figures at the debit of these possessions in 1822 fl. 57,359 and at their credit fl. 87,711. In the same year we disposed of our cloths there to the amount of fl. 122,797."

Valentyn informs us that, besides sulphur, wax, rattans, kajangs, rice, birds nests &c., ebony may be procured in the largest quantities and of a greater size than elsewhere, the tree being found on nearly all the islands around the N. E. promontory of Celebes. He also notices the abundance of fine and hard timber. (Oud en Nieu. O. I. vol. i. p. 65.)

Dr. W. R. BARON VAN HOEVELL.

The abruptness of Dr. Hoëvell's departure from Batavia to Europe in August last prevented us from recording so soon as we could have wished and in adequate terms, an event which every friend to the moral and political advancement of Netherlands India and every lover of science deplores. Although we trust that Dr. Hoëvell's absence will prove to be only for a time, we shall take this opportunity of noticing briefly, but more fully than we have hitherto done, his career in Netherlands India, which is probably not sufficiently known to our English readers. All the readers of this Journal are aware of the conspicuous place which he held in science and literature as the President of the Batavian Society of Arts and Sciences and the editor of the Tijdschrift voor Neerlands Indie, in the extension of morality and religion throughout Netherlands India as the originator and editor of the Tijdschrift ter bevordering van christelijken zin, and in the cause of social and political amelioration as the earnest and persevering opponent of legalized slavery in every shape, and the constant advocate for freedom of the press. The incessant activity and industry, prompted by philanthropy and an ardent thirst for knowledge, which enabled him to fill that place with honour, without distracting his attention and his feelings from the duties of his profession, and without hindering him from acquiring a mastery over the Malayan

language and literature and a more and more profound knowledge of the Javanese, Káwi and Sanskrit, are qualities by which he has been distinguished from his youth.

Dr. Hoëvell was born at Delfril in Holland. He commenced his education at Deventer, and completed it at the University of Groningen.

His leisure hours during his academical course were devoted to poetry, in which he showed much talent, and his poetical effusions were afterwards collected and printed, and the proceeds appropriated to benevolent porposes.

Shortly after his entrance into the University, the Belgian revolution broke out. He was one of the first students who volunteered their services to the government in the defence of their country's rights. At the end of the campaign he resumed his studies, devoting himself principally to theology, for which he had always shown great partiality. About this time the University of Utrecht offered a prize for the best essay on the value of Josephus as a historian. This prize was borne away from numerous competitors by van Hoëvell.

After leaving the University, he, by the advice of his cousin the Baron van der Capellen, late Governor General of Netherlands India, applied for and obtained an appointment as a Clergyman in Netherlands India.

Upon his arrival in Java the Government was then in the hands of the Governor General D'Eerens, who soon discoved in Mr. van Hoëvell evidences of the desire as well as the capabilities to render himself useful in his vocation. In order to secure the permanent stay of Mr. van Hoëvell in Batavia the Governor General placed under his charge the native Christian community of the place. Notwithstanding the numerous duties which this appointment devolved upon him, he found time to devote his attention to science, and endeavour to awaken the latent energies of those who had a taste for similar pursuits. He now formed the idea of commencing a scientific journal and giving to the world the result of the labours of himself and friends in the wide and important fields which Netherlands India offered to their researches. As has unfortunately always been the case with similar undertakings in Java, he met with opposition and obstacles at every turn. He determined however to try the experiment and issued the first numbers of the Tijdschrift for Netherlands India. The work rose in interest and importance, and for

eleven years he conducted and pushed it on through every difficulty until he established for it a reputation second to none of its kind.

The talents of Dr. van Hoëvell were so conspicuous that the Government determined to avail itself of them, and with this view appointed him to the office of historian of Netherlands India. Dr. van Hoëvell accepted the appointment on condition of its being honorary, refusing the salary of *f* 1000 per month which was attached to it and had been enjoyed by his predecessor. The Government was sensible of his disinterestedness, and in accepting his offer, "reserved to itself the right to reward him on some future occasion." The important archives of Netherlands India were now thrown open to him and he availed himself largely of them, by which literature would certainly have benefited much, had it not been that with the death of the Governor General D' Eerens appeared to die all the desire displayed by the Government in affording facilities towards the compilation of the history of Netherlands India, and the obstacles thrown in the way of Dr. van Hoëvel were so many and great that he was forced to abandon his undertaking. What those obstacles were it is needless here to enumerate, but they proceeded from a source which should have been the last to thwart him. His post is still vacant, and the world may deplore the loss of much valuable information, which can only be recovered when the seal now placed upon the hidden treasures shall be again removed.

Having been appointed one of the Committee of Instruction in Java, he made the interests of education one of his principal objects, and the numerous detailed and complete plans for its furtherance presented by him to Government, would certainly have advanced the cause if they had not, for some undisclosed reason and notwithstanding their utility and importance, been neglected.

On being elected President of the Batavian Society of Arts and Sciences on the death of the Governor General Merkus, he found it, as one of his predecessors Sir Stamford Raffles did, in a state of lethargy, and like him at once devoted his energy to rouse it into new life. He materially enlarged its library and enriched its cabinet of mineralogy and antiquities, and speedily raised it to the flourishing condition which it has for some years enjoyed.

The languages (modern and ancient), the manners and customs of the natives of Java were his favorite studies, and his numerous and interesting contributions on these subjects have been fully appreciated by the scientific world.

But in the midst of all this devotion to science the cause of religion was not neglected by him. The decided improvement in the moral and religious condition of the community entrusted to his particular care, his recent "Netherlands and Bali," in which he forcibly depicts the condition of the natives of that island and calls upon the mother country to save them from the ignorance and irreligion under which they have so long lain degraded, his "Journal for the promotion of Christian knowledge in Netherlands India," the Parapattan Orphan Asylum which is indebted principally to his exertions for the prosperous condition which it now enjoys, all bear evidence of his zeal and industry in the cause of religion and humanity.

From this short and hasty sketch it will be perceived how much his withdrawal from Java must be regretted by the lovers of science, and by all who take an interest in the moral welfare of that island.

On the causes which have led to Dr. Hoëvell's departure from Java we need not dwell. We trust he will succeed in the object which he carries with him to the mother country, and that he may soon return to continue his enlightened and zealous labours in the cause of religion and science.