

Letter 1800

On the Climate and Prevailing
Diseases of Singapore -
Part 1st

Singapore with Pinang, and
Malacca forms the "Straits" or
"Eastern Settlements" at present
under the jurisdiction of the
Bengal Government, but shortly
to be transferred to Her Majesty's
Colonial Department -

The Island of Singapore before 1819,
was entirely covered with primeval
forest, and inhabited only by about
300 Malaya, who living on the sea-
shore occupied themselves in
fishing and piracy -

In
February of that year, it was formally
taken possession of by Sir T. Stamford
Raffles, for H. B. M. on behalf of the
H. E. I. Co. —

The object this
eminent man had in view was, to
establish a commercial station to
counteract the new Dutch Settlement
of Rhio about 50 miles from Singapore,
and so completely has it answered
his expectation, that while the one
is now a miserable petty port, with
scarce any trade or shipping, the
other has a trade to the amount of
£12,000,000 sterling —

To what
does Singapore owe this sudden rise
and great prosperity? To four
causes; firstly, its position is
central for commerce; All ships
sailing

Singapore
reasons of its
prosperity —

from Remittent Fever, and if a Settlement had been made there, I have no doubt we should not have had the same amount of prosperity; as our enterprising Merchants and Colonists would never have been persuaded to settle in an unhealthy colony; but without knowing the comparative healthiness of the two localities, Providence seems to have directed him to what is now the flourishing Settlement of Singapore.

Position of Singapore

The Island is situated in N. $1^{\circ} 17'$ and Long. $104^{\circ} E.$, at the southern extremity of the Malayan Peninsula, having the China Sea on the East, and the Straits of Malacca on the South and West; - between it and the Mainland is a narrow passage, which in former ages was the route to, and from China, and which led to the ancient Malay city of Johore, the ruins of which are now scarcely to be seen, - but of which there is a Malay tradition that a cat could travel for two days from housetop to house top without descending. To the South of Singapore is a strait of 9 miles in breadth, thro' which vessels now pass on their way to, and from China, and on the opposite side of the strait is a large cluster of islands, so many

in

Sailing betwixt India and China, must pass within sight of it; All vessels from Europe to China in the S. W. Monsoon must pass equally near, and all vessels from China to Europe in the same Monsoon must pass in their direct route within a few miles of it— In the N. E.

Monsoon, vessels to China can either take this route, which leads to Singapore or another which is some distance from it, and lastly all vessels from the Australian Colonies to India generally call there, —

Secondly — It is within a few hundred miles of Siam, Java and Borneo;

Sumatra and the Malayan Peninsula are close to it; so that the commerce of these countries naturally finds its way to Singapore, further induced by the 3rd reason that it was the first British Free Port, to which the natives flocked rather than be subject to the duties imposed by the Dutch Government —

various and
oppressive

The fourth reason of its prosperity is, its rare healthiness, to which we shall now particularly turn our attention —

At one time Sir Stamford Raffles thought of fixing on one of the Cariman Islands, situated about 15 miles from Singapore as his Free Port; but that island is eminently unhealthy

in number, that they are called by the Malays "the Thousand Islands".

About 30 miles from Singapore is the nearest point of the extensive island of Sumatra, which exerts great influence over the climate of Singapore — This island of Singapore resembles the Isle of Wight in size and shape — It is $25\frac{1}{2}$ miles in length, and 14 in breadth and contains about 200,000 square acres, of which about 50, or 60,000 are under cultivation, the remainder being covered by primitive jungle —

Physical
Character

The highest point in the island is near the centre, and is named Bukit Timah; Tim Hill; because that metal was at one time obtained from it — its Elevation is about 500 feet above the level of the sea — The other parts of the Island present sloping ridges with valleys between, varying from 50, to 180 feet in height —

The valleys are not extensive, with the exception of that on which the Town is built — The island is partially surrounded by fringing reefs of Coral, but these do not affect the health of the inhabitants, except in two or three places where they are exposed at low water —

Sand and Mud, with here and there rocks of Sandstone and Iron Clay stone, form the Anchoring ground

ground close to the shore - The rivers are very small but numerous, many creek like recesses being seen on coasting the island, which are apt to be mistaken for the mouths of considerable rivers - these are merely salt water creeks with a small stream opening into them. Extensive marshes exist along the coast, but they are all subject to tidal influence - they are thickly covered with Mangrove trees -

Soil

The Hill above alluded to called Bukit Lima, is composed of Granite which with Sandstone of the tertiary formation may be said to form the only varieties of rocks on the island, and by their disintegrated material with the detritus of Coral, and the humus of plants; the soil is formed.

The upper soil is light and porous, on the tops of hills a white sand; towards their base a greater mixture of Alumina, and the whole is colored with iron forming what is known as red soil - Some hills are covered with nodules of Alumina and iron which receive the name of "Laterite", and are much used for macadamising the roads; for which from their quality, they answer admirably - This kind of soil has in India obtained the credit of being the cause of fever, from the circumstance

circumstance of fever being endemic where it apparently formed the only mineral, but I cannot imagine how it can generate fever any more than granite in the Orinoco as supposed by Humboldt - unless we conclude that the soil which is formed from disintegrated laterite and granite is favorable to luxuriant vegetation the decomposition of which may originate fever - but this is not the case in Singapore -

From an analysis by Mr. Velezou, of soil brought by me from Singapore, that of the Vallies is composed of silicious matter from the washings of the hills mixed with much humic acid; and in small quantities, the phosphates of lime and magnesia with nitric acid and ammonia; the result of the decomposition of animals - as the soil of the hills contains Silica and Alumina; and the Vallies Humus and phosphates, the mixture of the two, forms a rich soil for all kinds of plants, especially pines and palms which require much silicious matter. In excavating the valley of Singapore marine shells and black mud have been found, shewing that a process of elevation has been going on -

The great physical feature of the Island is its forest or ~~Jungle~~ ^{Jungle} composed of palms, as the ground cotton the cabbage and wild areca palms, many kinds of Ficus, Orchids, and Creepers, which last in the most fanciful and wondrous way twine around and interlace with the

the tall trees, such as the Poou, which furnishes a resin called by the natives Mata Kuchin (Cat's eye) known in commerce as Copal.

This tree attains an immense size and great height — I have measured one whose circumference, five feet from the ground, was 36 feet. The branches are all thrown out from the top, so that the stem runs up from 60 to 120 feet without a branch — Many other trees grow so closely together that it appears surprising they do not destroy one another, while the many creeping plants, as the ground rattan which attains the length of 500 or 600 feet; another species from which an elastic gum like Caoutchouc is procured, ~~while~~ ^{which} a thick ^{which} affords a large supply of pure and limpid water; a refreshing beverage for the thirsty traveller; ~~the~~ twine around the trees, and make an almost impenetrable thicket, completely preventing the sun's rays from impinging on the ground and in all probability hindering the development of miasm.

This dense forest covers the island except where it is under cultivation, and extends to the sea shore, to the verge of tidal influence; when the Mangrove almost equally thick, takes its place even to the limit of low water mark. — The banks of rivers are equally wooded, and when the variety of foliage and forms of trees, and beautiful flowers are seen from a boat, as it glides along

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one

one of the rivers, few things in nature can surpass it.

The jungle where cut down is replaced by a rank grass called "Alang Alang" of little use as food for cattle, while its wide spreading roots are of such strength as to pierce several feet into the roots of trees at considerable depth below the surface of the ground; causing great annoyance to the farmer.

It is only when the jungle is cut down, and the ground returned as we shall see that malaria is generated in this Island.

Meteorology of Singapore -

Meteorology

The winds on which more than on any other atmospheric influence depends the salubrity of any climate, are both local and general -

The local are the land and sea breezes; the general, are - while squalls, the N. E. and S. W. Monsoons. - The to which the land breeze commences to blow about inhabitants owe so much, may be 8 P. M. and continues till betwixt 5 and 6 P. M. when it is replaced by the warm considered as accidental - sea breeze, or sometimes by a calm.

The further removed from the sea, and the nearer the jungle, the sooner is the land breeze felt, and the cooler does it appear; Land breeze where there is much cultivation the breeze is not so cool, as when direct from the jungle, and in close proximity to it.

The land breeze is a great boon to all the residents, especially to European females whose relaxed frames are

are refreshed and invigorated by it, as it grows cooler towards morning. - During the N. E. Monsoon the land breeze sets in earlier than during the S. W. Monsoon while the sea breeze is just the contrary.

Sea breeze

The latter commences to blow early in the morning - increasing during the forenoon and lulls at sunset, when there is generally a calm, for an hour or two, till the land breeze sets in.

In Singapore Lower the sea breeze is always to be ~~distinctly perceived~~ ^{recognized, by its warmth}, as it flows over shallow seas, which during the day are heated by the sun's rays.

When the wind blows from the S. S. W. the natives give it the name of Angin Jara (Jara Wind) because it comes from the direction of that Island. - In the month of September this wind is very much felt, especially by old residents and ladies - In those who are weak and sickly it causes clammy perspiration with much languor and lassitude, which is in a measure experienced by the strong and robust, so that on rising in the morning they feel unrefreshed and even more wearied than on going to bed. It also gives rise to Coryza which with many is a most troublesome and incurable affection. -

To the feathered tribe this wind is especially inimical to Turkeys for example -

It does not extend farther inland than the confines of the jungle - where

Peninsula, and on the South and South West by Sumatra, and the numerous small islands on the other side of the Straits - as also by its proximity to the Equator - still the winds are merely tempered by these protective influences; and if more than ordinary heat has accumulated moisture and electricity, a squall generally sets in; that is a smart breeze of wind, followed by a shower of rain, and sometimes accompanied by thunder and lightning -

Squalls

heavy

These squalls seldom last more than one or two hours - according to the direction of the monsoon, so is that of these squalls - In January when the North East monsoon is blowing, they are from the North, during the South West monsoon, they are from the South or S. S. W. Their frequency is uncertain, during one month there may be 4 or 6, in another 20; but they are more frequent in April and September; in the former month the N. E. monsoon changes to the S. W. and in the other from the S. W. to the N. E.

A squall is known to be approaching when a dark cloud (nimbus) is seen rising from the sea with its outer edge convex, and lighter in color than the mass behind, which is nearly black - The cloud quickly spreads over the heavens, 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 comes the breeze, quick in its progress, powerful

powerful in its effects, and short in its duration, followed by a heavy shower of rain, by which Nature in all shapes is refreshed - These squalls are recurrent but each time earlier, like a fit of ague, and more frequent betwixt the hours of 3 and 5 A.M. than at any other time -

I have been thus particular in my description of the currents ^{of air} in this climate, because much of the health and comfort of the residents depend on them, indeed by several authors, the immunity of Singapore Town from fever is attributed to its free ventilation; but I shall presently show that altho' this greatly assists, it is not the sole cause of its salubrity -

On Rain &c

Rain &c

A most important subject in considering the Climate of a country is the rain fall and quantity of moisture in the Atmosphere. It has been generally stated that, at and near the Equator, more rain falls within the year than in other places, but the number of rainy days is less, than in higher latitudes. According to the Journal de Physique the mean number of rainy days. "from N. Lat. 12° to 43° is $78\frac{1}{2}$ - from 43° to 46° it is 103. from 46° to 50° 134 - and from 51° to 60° 161 days." Pinang situated about 400 to the N. W. of Singapore at the opposite entrance of the Straits of Malacca has according to St. Ward an average of 182 rainy days - I am sorry I cannot furnish a table of the number of rainy days in Singapore, but in the Madras Quarterly Medical

Medical Journal for 1839. I find the following statement, which coincides with my experience of the climate -

"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 on 229 days, in 1821, on 203 days; in 1824 on 136 days, and in 1825, on 171 days, giving an average in 4 years of 185 rainy and 180 dry days"

This makes Singapore an exception to other lands near the Equator, in the number of rainy days, and contributed to the salubrity of the place - The following Table gives the Rain fall -

Fall of Rain at the Singapore Observatory shown by the number of Inches.

Months	1841	1842	1843	1844	1845	Fall of rain each month for 5 years
January	3.750	22.585	18.070	10.219	5.750	60.374
February	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
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
September	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	89.117		

Taking

Taking the average of the 4 complete years we have 92.697 inches, as the annual fall of rain in Singapore - which nearly corresponds with Humboldt's statement that in the respective latitudes of 0° 19° 45° and 60° the annual depths of rain are 96. 80. 39. and 17. inches - From this table we find that the greatest fall of rain occurs during the N. E. Monsoon, which is therefore often called the wet monsoon -

Many tropical countries have an equal, many a greater fall of rain than Singapore, but it is confined to one time of the year - and therefore they do not receive an equal amount of benefit with it, where the rain fall is more uniformly distributed throughout the year - Dr. Twining

in his account of the diseases of Bengal states, that heavy rain followed by great heat is the occasion of much disease, In Singapore the rain falls in gentle showers throughout the year, gives perpetual verdure to vegetation, cools the surface of the earth, and precipitates Malaria before it can be diffused and concentrated in the Atmosphere -

From this cause the jungle is evergreen and loaded with moisture; it cools the currents of air that blow over it, giving us the pleasant and refreshing evening breeze, while the numerous small streams pour into the ocean the surplus moisture which the vegetation and thirsty soil fail to take up - The Atmosphere is charged with moisture, and reckoning that at the limit of

of congelation, air absolutely humid holds in solution the hundred and sixtieth part of its weight of moisture, we need not be surprised that the Atmosphere of Singapore contains twice as much moisture as that of Great Britain —

Temperature.

Temperature

We find the Thermometer which is of so much value in higher latitudes, of but little value in this — because the feelings are so acute, and the body so susceptible of the most trifling changes in temperature that often it seems as if a great change had taken place, when we find the Thermometer but slightly affected —

For instance, before a Squall, we feel the air hot and oppressive, the perspiration streams from the forehead — the mind and body are relaxed, the muscles lose their tone, but as soon as the squall bursts, and the air feels cool, nature appears to have thrown off a load, the spirits recover their elasticity, the muscles their tone, and man feels that he has recovered his freshness and elasticity — Changes have certainly taken place in the electric Hygrometric, and Thermometric conditions of the Atmosphere, but any one examining the Thermometer will be surprised to find that it will only show a fall of from 3 to 7 degrees — Such impressions could not be produced in this country by less than a change of from 10° to 20°

The following

following Table gives the mean of observations taken each hour for every day in the month during 5 years—

Thermometer	Month	Thermometer	Month	The mean temperature
	January	79.55	July	82.24 for 5 years
	February	80.25	August	81.80
	March	81.22	September	81.76
	April	81.47	October	81.21
	May	83.31	November	80.63
	June	82.29	December	80.24

From these and other data their talented observer the late Captain Elliot, considered the following conclusions established— "that the range was generally from 6° to 7° — that the greatest height to which the thermometer ever rose was $87^{\circ} 5$ in the month of June 1842 whilst the lowest to which it ever fell was $74^{\circ} 7$ in the month of January 1843. That the coldest month of the year was January—that the hottest was May; the mean of the former being $79^{\circ} 55$ and of the latter $81^{\circ} 31$ — 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 5 years was $81^{\circ} 24 7$ — and the difference between the hottest and coldest months amounted to $2^{\circ} 76$ — 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 a thermometer daily at 6 A.M. and 3 P.M.— would

"would by finding the mean, obtain the general mean temperature during the period of observation."

The mean temperatures of the following years shows that they do not vary one from another a single degree—

1841	1842	1843	1844	1845
81°28	81°61	81°09	80°82	81°66

From observations made by Captain Davis twenty years before Captain Elliotts, I have constructed the following table, but as his table is the mean of observations taken at 6 A.M. and at Noon, I have contrasted it with a calculation from Captain Elliotts at the same hour.

Captain Davis					
1820.	1831.	1822	1833.	1824.	1825
79°5.	79°4	80°02	79°8	81°0	81°4.
Captain Elliotts					
1841	1842	1843	1844	1845.	
82°	82°8	81°58	83°7.	84°04	

From this we see that the temperature of Singapore has increased in 20 years 2°48— or we may suppose that owing to another method of conducting these observations the difference has arisen —

In the first case, when Captain Davis made his observations there were very few houses in Singapore and they were surrounded on all sides by primitive jungle.

Twenty years after when Captain Elliott made his observations, the jungle immediately surrounding the houses, had been

cut

Has the temperature of the Island increased during the last 40 years?

down, and the ground brought under cultivation. — The mode of conducting their observations by these two enquirers may have led to the difference in their results — for I found that by constructing a ^{of Pandanus leaves} house with a double roof, and so sloping as to prevent all direct and reflected rays of the sun from impinging on the thermometer, while it was open to all currents of air; — that the Mercury fell one morning to $68^{\circ}50$. which Captain Elliott never saw in his confined brick built observatory — The next table requires no comment

Solar and Terrestrial Radiation, and the Barometer.	Months	The mean of Solar Radiation	The mean of Terrestrial Radiation	The mean of the hourly reading of the Barometer	Remarks.
	January	115.33	$68^{\circ}20$	29.917	The Solar Radiation
	February	119.62	63.02	29.914	for January is the mean
	March	119.87	64.52	29.884	of 3 years, for the other
	April	119.90	67.04	29.886	months 4 years —
	May	122.97	67.90	29.872	The Terrestrial Rad. for
	June	119.97	66.40	29.858	Jan ^{ry} is the mean for 4
	July	121.62	66.52	29.868	years, as well as the
	August	123.52	66.42	29.880	months of Sept. Nov & Dec
	Sept ^r	125.02	66.95	29.886	The three months for 5 years.
	October	122.32	65.37	29.897	The observations on the
	November	125.52	64.95	29.866	Barometer are for 5 years
	December	122.35	66.	29.884	except during the months
					of Sept. Oct Nov & Dec —
					Which are for 4 years.

According to Professor Meyer of Göttingen the medium temperature of the land on the Equator

Equator is $84^{\circ}20'$. and low as that is for a tropical country, we find that Singapore is actually lower; the mean annual temperature being $81^{\circ}24.7'$ - Now this Reason of the may be accounted for by the amount of comparative moisture which is attracted, and falls, not low temperature only on the Island, but also on the mainland of Singapore.

The rain that we have in such abundance is the refrigerent - according to Dr. Playfair water in its ~~conversion~~ conversion into steam or vapour absorbs 965° of heat, and if 3000 tons of water annually fall to an acre in England; in Singapore it will be nearer 10,000 tons - this when multiplied by the 200,000 acres gives an enormous total ~~amount~~ ^{allowing that much of this water runs off at once.} Still, a very large ~~quantity~~ must pass off in the form of vapour, thus rendering latent a vast amount of heat - need accounting for the lowness of temperature - As the rain is so equally distributed throughout the year - the slight variation of temperature is easily accounted for.

Part 2nd

In the following pages the influence which The influence the Atmosphere and the physical condition of the Physical of the surface of the Island exert on the Geography and health of the inhabitants, and on the developement of disease will be investigated - on the Climate -

To facilitate this, I shall consider first the influence of uncleared jungle or natural forest; second, the fresh water marshes and valleys; - Third the salt water marshes subject to tidal influence and fourth the exposed Coral

Coral Reefs which fringe the shore — The

Primal forest. Primal forest exerts very little influence not unhealthy upon the settlers in, and near it — I have known Europeans who lived for months in the native forests without injury to their health, and were annoyed only at certain times by the tree leech whose bites are often troublesome to heal.

Many residents built their houses at a distance from the town, on the heights of the small ridges that diversify the scenery of Singapore, and altho' they were surrounded by the jungle, I never remarked that they suffered from fever or any malarious disease — unless a fresh water marsh existed near them — The same observation applies to Penang — where the greater part of the island is covered by dense forest in the midst of which are houses whose inmates enjoy excellent health. In the Malayan Peninsula, 14 miles from the town of Malacca, is a hot spring surrounded by primitive jungle — Near it is a Bungalow, in which I lived for a month without experiencing any symptom of fever, and it has been used as a residence for invalids for the last 30 years without in the least giving rise to the idea that fever could be produced by the jungle. I know that the same observation applies to Borneo — the Town of Sarawak is surrounded by primitive jungle and is a most healthy settlement, entirely free from endemic fever — In Java the same also; in fact the most ample experience has proved that residence near or amidst primal jungle in the Eastern Settlements is not attended by fever, produced by malaria —

It is

It is difficult to explain why such a dense mass of vegetation should not be productive of Malarious influence when a much less amount of vegetation freely exposed to sun and rain, will do it —

Liebig gives a reason for the slowness of vegetable decay in such situations — and this slowness of decay may be the reason why there is not sufficient malarious influence generated to produce fever —

When woody fibre decays, the Carbon unites with the Oxygen of the fibre — and forms Carbonic acid — while the Hydrogen takes Oxygen from the air to form water —

This gradual combination of the combustible elements of a body with the Oxygen of the air is what he terms *cremation*.

Now in a dense forest where the sun does not reach the ground and ventilation is not perfect — the Carbonic acid formed, rests as a layer on the ground and around the vegetable matter, ~~pre~~ preventing the access of the air, and so arresting further decay —

But if the jungle should be cut down and the ground turned up for agricultural purposes before it has been deprived of its moisture by drainage; — this decay goes on rapidly — and with the decay, is generated that "something" which gives rise to fever and certain other diseases, and is called *miasma* or *malaria* —

Secondly, I will consider the influence exerted by the fresh water Marshes or valleys. These differ widely in their effects on the human constitution from the first mentioned.

They

They are usually bounded by hills, and many of them present the appearance of valleys - at one time having been covered with original jungle, which has been cut down by the natives for agricultural purposes such as rice fields &c but that not being found a profitable employment, they have been deserted and are now overgrown with rank

vegetation, such as counts a boggy soil. The greater part of the rain that falls sinks through the vegetable mould, and lodges in the clayey subsoil, giving forth continual moisture to the plants, such as the grapes which run up to the height of 6 feet or more vigorous and strong - when they die, their decay gives strength and stimulus to others that take their place - The sun shines down with full brilliancy and effect having no high trees to ward it off, and raises into existence many forms of organic life with alarming celerity - The hills around protect these valleys from the local breezes and welcome squalls, and ~~thus~~ the close warm atmosphere gives rise to feelings of lassitude and ~~languor~~ while want of currents of air, and the ~~presence~~ ^{presence} of so much moisture retains the Malaria -

A few natives may be seen located on the sides of those hills, but they are subject to intermittent fever and occasionally to remittent -

But the visible living inhabitants in such localities are confined to frogs and snakes. the first are met with in immense numbers, the latter sometimes attain great size, as

the

the Python or Boa Constrictor which I have seen 30 feet in length - To these we may add the Snipe in their season. Wild Pigs are occasionally seen, and even Deer followed by the Tiger, but all these animals retire at night to the more elevated jungle around -

In such places Woody fibre decays with great celerity, as there are no trees to prevent the access of the Sun, and there are just sufficient currents to prevent the CO_2 from arresting the decay -

As much of the woody fibre is immersed in water, we have Carburetted Hydrogen and small quantities of Sulphuretted Hydrogen as additional products.

Until 1842 no European had lived contiguous to any of these valleys and very little was known about their salubrity - indeed it was taken for granted that as Singapore Town tho' surrounded by marshes subject to tidal influence was healthy so must all the island be -

In 1842, wishing Personal ex- to amuse myself with planting Coconuts &c. & other agricultural pursuits, I perceived the effects of a ~~depression~~ about 200 acres of ground and built a fresh water Bungalow on a hill 6 miles from Town Marsh & Valley and one mile from the Sea, with a swampy valley to the East and South East - the primitive jungle behind -

I had not occupied it a month, sleeping there only two nights weekly, when I was attacked with intermittent fever of so severe a type, that it did not leave me for months - My Brothers who occasionally slept there were similarly

attached

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attacked, but the fever with them was of a milder type - At the base of the valley a mile or more from my dwelling, 4 gentlemen had a house erected near the seashore - They like myself only slept in it two nights weekly, and they all got intermittent fever. Such an unusual fact as fever being endemic in any part of the Island, induced me to institute enquiries amongst the natives of the village of Siglap, which is situated on the sea beach, but close to the marsh, and I found that the inhabitants were very subject to intermittent fever, and some had even had remittent fever. I saw groves of fine fruit trees, within which were the remains of houses, on the slopes of the adjoining hills; and on making enquiry ascertained that they had once been inhabited, but fever and Tygers had swept away their inhabitants -

To what cause could this fever be attributed, the only conclusion I could come to was, that it was generated by the marshy valley - for its proximity to Singapore convinced me that in its temperature, currents of air, rain, and other meteorological conditions it did not differ from the Town which as I said before, is free from fever.

I therefore considered that the valley being drained, if the fever depended upon the soil, it would then cease - At that time the Government officials were anxious to dispose of their lands and to induce me not to give a bad character to that locality
they

they agreed to make a drain through the lowest part of the valley to the sea. $1\frac{1}{2}$ mile long, 6 feet broad, and as many deep. This had the effect of carrying off all the superfluous moisture, and soon after instead of a swamp of such a boggy nature that if you took a few steps in it, you would sink several feet, it is now a dry cultivated plain, firm under foot - growing vegetables and coconut trees - Six months after the drain was opened, Intermittent fever had disappeared so that ever since (except on one occasion) those who have resided in the two Bungalows mentioned; not for days only but months have not been attacked by fever, and it is scarce to be met with in the village where it was endemic formerly - But in one very wet season two or three years after the drain was made, fever again broke out in the village of Siglap, this on examination was found to be caused by the drain having become obstructed; when it was cleaned the fever left, and as it has been annually cleaned no similar return of fever has taken place - A like fever attacked the Convicts, who were making roads near another Marshy valley called Buddos - When it was drained, the fever left them - From the number of similar instances I came to the conclusion, "That on draining a fresh water Swamp, the epidemic fever will disappear, but on obstruction of the drainage the fever will return" -

I have

Reel work

Marine work

but no influence

I have in the 3rd place to speak of salt water marshes subject to tidal influence -

This embraces a great extent of the Whymal surface of the Island as well as the shores of the Peninsula and the neighbouring isles

In sailing round the island of Singapore every stranger remarks how wooded it is even to the water's edge, so that in high tides the sea may be several feet deep round the roots of the Rhizophora Mangrove and Avicennias -

Indentations are also seen corresponding to the mouths of rivers, but so wooded that the streams are seldom to be seen - The depth of this belt of Mangrove varies in some places from a few yards to some hundreds according to the amount of tidal influence.

The town of Singapore is built on either side of a river which has not a long course, but for about 2 miles its banks, and that of its tributaries are covered with Rhizophoras Avicennias and Pandanus -

By the junction of these tributaries small islands are formed which are covered with the same kinds of trees, on the fruit of which subsist numbers of Monkeys - and amongst their interlacing roots at low tide basked the Alligator -

When the tide is out the view of this marsh is anything but pleasing, and the smell is far from agreeable Black fetid mud only is to be seen, with very little water. Tricking thro' the centre of which might be the ~~separated~~ channel of a noble river when the tide is full -

Sand Banks

Sand

Banks obstruct the navigation of boats, and mud and sand frequently choke up the Estuary, and force it to find another channel -

When the tide is out and the sun in all its brightness pours down its rays upon it, most fetid is the exhalation especially after a shower of rain; foul also is the sight of it, so that all strangers and many residents imagine such marshes to be most noisome -

Yet Singapore - Singapore built is built on, and is surrounded by such on a salt water ground, of at least a thousand acres, and a more healthy town in the world cannot be found -

Where the town is built all the Mangroves have been cut down but the old river tributaries still remain; their sides being embanked, they serve for drains and canals for boat traffic. Along the sides of the canals houses have been built inhabited principally by Chinese who are very healthy and not subject to fever, tho' to such an extent is the sulphuretted hydrogen evolved from these canals, that all white paint is almost immediately blackened - The old jail was built along side of this canal and tho' frequent, great, and well founded complaints, were made of the foul smells, yet in the 18 deaths which occurred amongst 1447 inmates during a term of three years from 1844 to 1847 - not one was from fever -

Some thousands of Chinese and Malays live in boats in these canals and in the mouth of the river - These people if they

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not
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Marsh is healthy.

they occasionally visit the shore, always sleep in their boats. which float with the tide, and rest on the mud at ebb - yet my frequent and most careful investigations failed to discern any fever amongst them - In other

Mangroves parts of the Island, the Malays from preference not necessarily construct their dwellings by the banks given unhealthy. amidst the Mangroves; they do so also on the mainland; - and unless there was a fresh water marsh, or exposed coral reefs near them,

I never found them subject to remittent or intermittent fever - This observation

of mine of the freedom from malarious influence of salt water marshes subject to tidal influence is not confined to Singapore and the adjacent islands, but extends to Borneo Java and even to Australia. whose shores are in many places fringed with the Mangrove - I may not dispute

that in other climates such forests of Rhizophoras and Avicennias produce fever, for we have the authority of Humboldt Wallace and many other writers that they do - and I have no experience to the contrary, but that such trees and such marshes do not originate fever in the localities I have named I consider cannot be questioned by any who have personally examined such places - In these marshes subject

to tidal influence we have the same decay going on as we find in fresh water - The wood changes its element - CO_2 is formed acid H_2O the Hydrogen of the wood combining with the O. of the atmosphere - We have also Carburetted and Sulphuretted Hydrogen eliminated the latter in such quantities as to blacken

moistened with acetate of lead, in some places in less than an hour. In the decay of animal and vegetable matter in fresh water marshes, in addition to $C.O_2$, H_2O and C_2H_4 there is a "something" called Malaria whose composition is unknown and whose existence is only presumed from its effects, - as fever and other diseases - How it acts is equally unknown, it may be organic, molecular and multiply like cells, or like the ferment of yeast exert a catalytic force on the fluids of the body and so produce fever - This Probable reason why salt water marshes must either not be generated in marshes are salt marshes, or if generated, there must be not unhealthy counteracting forces to render it innocuous -

One ^{of these} is the rise and fall of the tide twice in the 24 hours - the second is the presence of Sulphuretted Hydrogen in such quantity that I venture to suggest it may be the means of destroying the Malaria, for the following reasons -

1st That air containing only the proportion of an 800th of H_2S according to Thénard and Dupuytren, will destroy small birds - Why should it not when more diluted destroy cell life or that something which is called Malaria -

2nd Liebig mentions that at Sausenbach in cases of poisoning from badly prepared Sausages, where a disease similar to fever produced by malaria, was caused; H_2S given in water arrested the poisonous action.

3rd In many situations where H_2S is freely disengaged in and around Singapore - The salt water marshes are

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Quans

Local

are innocuous, while in other situations where no H. S. can be detected as in fresh water marshes and ~~exposed~~ exposed coral reef localities which I have examined, fever is endemic.

again, many who have traded to the most unhealthy parts of Africa have testified that the crews of ships riding in the bays and mouths of rivers, escaped fever - in these situations H. S. abounded; but boating parties who ascended the rivers above tidal influence were attacked by fever.

Capt. Owen in his Narrative of the Surveying Expedition to the East Coast of Africa exemplifies this statement for he says "That amongst the men ill of fever on board, there was not one who had not been employed away from the ship, they were either boat's crews who had been up the rivers, or those who at different times had lived at the Observatory"

Whilst such estuaries at Singapore and the adjacent islands, are usually of great size compared with the small streams that are poured into them, they ~~are~~ ^{are} ~~are~~ for the above reasons comparatively free from malarious influence, as well as many extensive sea boards where no large rivers open into the ocean, but which possess mangrove marshes subject to tidal influence -

Such is not the case Localities where where we have large rivers that periodically overflow their banks, and produce on either side lagoons or marshes filled with fresh or brackish water, which has no outlet and can only dry by evaporation - then we have malaria formed - and that frequently of a most

a most concentrated character - as in Bengal,
giving rise to remittent fever. but chiefly
of the intermittent type in latitudes near
Singapore - as in the East coast of Sumatra
&c. &c.

We now come to the last subject of this section
The influence of exposed Coral Reefs on the
health of those living near them -

I was a resident in Singapore for several
years without witnessing any cases of
remittent fever arising from malarious
influence in the island - indeed in the
course of 18 years experience, I know of only
6 cases of this fever having attacked Europeans,
which had a local origin, and they could
all be traced to exposure to the influence
of fresh water marshes at some distance
from the Town, this corresponds with the
experience of my fellow practitioners, and
predecessors - In the Public Hospitals
90 per cent of those admitted for remittent
fever; were shipwrecked crews of vessels, who
had received the infection elsewhere - or convicts
who had been employed at an adjacent
island - Intermittent fever was also
a rare complaint amongst the residents
in the Town and even amongst the coolies
who were employed in cutting down jungle
and making roads, the mortality was little
more than one per cent & in those attacked -

So that in my opinion the town and country
of Singapore were singularly free from fever

But such is not the case with the adjacent Black
island just alluded to called Pulau Tekong. It is
on which

Influence of
exposed

Coral Reefs.

Singapore
its immunity
from fever.

9 on which was formerly a signal station remarkable to which was attached a European Superintendent for its em. and Convict Assistants - The signal station was removed on account of the great fever mortality from fever of so many Superintendents and Convicts, that Government at last could not induce free men to risk their lives by going there -

The Bugis, who are the greatest Native traders in the seas of the Eastern Archipelago, had located themselves at the foot of the Flag Staff Hill, but most of them had died off, and the few remaining were sickly objects with enlarged spleens, Senecorythematic, and continually afflicted with intermittent fever.

Near these houses is a promontory running a few yards into the sea, on which 18 Chinamen once lived, who were engaged burning coral for mortar of these 12 died, and the remainder returned to Singapore -

Such extraordinary mortality surprised me, nor could I account for it, for there were no fresh water marshes near, and the strip of land on which the houses were built was so small that it was impossible it could have generated sufficient malaria to cause such mortality, even if it had been a marsh, which it was not -

Supposed causes of the decomposition of Pine Apples - but that I the Fever found could not be, as other islands were covered with Pines, and their inhabitants were healthy - and even on this same island were many houses surrounded by pines, whose inmates were healthy -

At length

At length about 13 years ^{since} on landing at
this sickly spot for the purpose of investigating
the cause of the fever, my boat could not
approach the beach on account of the tide
being out, and I had to walk over an
extensive coral patch which was exposed
only at low water. I noticed that a
most disagreeable effluvia emanated
from it, and as the delicate coral crumbled
under my feet, the thought struck me 'why
should not the decomposition of the animal
zooephytes in the coral, with the vegetable
matter on it, cause fever, as well as the
like amount of animal matter on shore?'
On further investigation I found that the
patch of coral was of great extent, and for
several hours daily was dry at low water;
from this a most disagreeable smell eman-
ated, such as putrid animal matter alone
will give forth, with something peculiar
to its marine origin, and when the wind
blew during the N.E. monsoon over the reef
towards the inhabitants on the beach, fever
was always rife - while in the other monsoon
they were not so subject to it. As the wind
then blew over the island towards the reef.

I also remarked that in the change of
the monsoon, when there are alternate showers
of rain and sunshine, fever was more
prevalent, probably from the greater destruc-
tion of the coral zooephytes by such weather.

Other islands also afforded me strong
proofs of the correctness of my conclusion
that where exposed Coral Reefs are present

Coral Reefs
at Blakham
Water -

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more or less Malaria is generated."

In pursuing my investigations I found that ~~two~~ localities subject to the same influence of coral reefs exposed at low water, might differ from each other in the virulence of the endemic. For instance in the Island of Blukau Mati we have an exposed coral reef in front of a beach that is only 80 yards in depth, and behind it a hill of 300 feet or rather more in height, rises almost perpendicularly -

The consequence is that ventilation is very imperfect, and the Malaria wafted in the one Monsoon to the island from the reef, seems to fall on the houses below the hill, and in the other monsoon, the hill by preventing the access of the wind to the beach, causes a lull which keeps the Malaria "in situ."

Other islands again have no high land and the Malaria generated on the reef is wafted away in the breeze -

Even high jungle will prevent the diffusion of Malaria, and will ~~cause~~ more unhealthiness amongst those located betwixt it and the reef while it will prevent also the Malaria passing to those living beyond it -

ventilation is all important therefore all important; - if it is perfect, no fever will exist as an endemic; if imperfect very little Malaria even, will produce it.

I therefore draw the conclusion "that from all exposed coral reefs, Malaria emanates; and the ^{power} ~~propagation~~ of the Malaria depends on ~~the~~ its non-diffusion from want of ventilation; for it may be so modified by solution in the surrounding atmosphere, that when it reaches a ventilated locality, it is innocuous, as

a drop

"a drop of Sulphuric acid will burn when concentrated, but if diluted will lose its effect."

This applies to many parts where Coral Reefs abound but where the ventilation is so perfect, on account of the trade or other winds continually blowing on them, and having no high land or jungle to obstruct it (some being little more than a few feet above the level of the sea); that no bad effects are produced by the Malaria which the reefs engender. — As in the Cocos, and many of the Pacific Islands.

The heatthiness of islands in the Pacific, being to their perfect ventilation

This cause of fever will alone account for that of many islands near Singapore and ~~in~~ other places; — such for instance as the Harbour of Batavia — From times far back this Seaport has been looked on as one of the most unhealthy in the world.

Batavia

Few ships anchor there without their crews being attacked with Fever, especially if their ships were forced down at the island of Orust. — Then at least ~~only~~ third or half of them perished from remittent fever —

In 1849 H. M. S. Steamer "Bromo" while anchored at Orust with a full complement of 150 men, had 116 laid up or dead from fever.

Solan,

Kypper's islands, and others are equally unhealthy, but not being as much frequented are not so well known.

In the town of Batavia and the shores near it, there is a fever endemic, identical in its character diff. or with that in the Harbour; yet I consider the cause is different, for the following reasons

The fever of the Ha

reasons — 1st That vessels anchoring 2 miles from shore are comparatively free from fever, but those anchoring nearly 5 miles off, and close to the island of Oerust, are very subject to it. —

2nd Vessels anchoring under the lee of Oerust and Kuyper's islands, suffer more when the wind comes from the sea and flows over the islands, than when it blows from the Town of Batavia

3rd — The European Residents by living about 2 miles inland from the Town, are almost free from fever, whilst vessels further distant have their crews subjected to its influence —

In 1800. The English besieged Batavia and four ships of war were anchored in the roads — The "Brave" was at Oerust, and very soon, nearly all her crew were attacked by fever. The "Centurion" relieved her, and her crew shared the same fate —

The Commanding Officer thought the island was unhealthy, from its proximity to a sand bank called Ontong Jara, tho' it was 3 miles distant — and he ordered that the men should be taken from the Hospital at Oerust to one built on a small island called Edam, nine miles distant from any point of land. — But the mortality did not diminish and of 60 soldiers who were landed as a guard, 31 died at Edam, 22 at sea, and 7 were taken to Malacca Hospital —

Of 16 marines from the "Centurion" 13 died
and

and nearly all the sick transferred from the Hospital at Orust including the Surgeon and 9 officers - The loss of the Seamen is not given, but it must have been great - Many of these cases of fever were contracted at Orust, but the majority at Edam - for some were 30 days there, before it broke out, a length of time far exceeding the usual period of incubation - showing that the fever must have arisen from some cause in the island of Edam; as it is ridiculous to suppose Malaria ~~came~~ from the mainland could have traversed 9 miles of sea, passing over vessels anchored intermediately, without affecting their crews - for instance "H. M. S. "Daedalus" was anchored halfway betwixt the town and islands, and her crew escaped fever, with the exception of 2 officers who slept on shore -

Mr. Wade Shields the Surgeon who reports this mortality describes Orust as "a small island three miles from the main, well cleared of trees underwood and jungle, nearly flat and free from swamps and marshes, except one very small spot which however is daily covered by the tides"

Edam is described by Captain Leisk a friend of mine who knows it well, as an "island about 10 miles from any point of land a $\frac{1}{4}$ of a mile in diameter covered with trees and bushes, but I never saw a

Swamp

"swamp, it appeared to me to be dry; the soil is a mixture of coral, stones, and coarse sand"

Both islands are fringed with coral partially exposed at low water, which I consider to be the cause of their endemic fevers. —

The following two facts alone would be sufficient to convince the most sceptical of the truth of this —

St. Johnston a Graduate of this University who has for 15 years practised in Batavia informed me that a few years ago, the Dutch Government attempted to construct a Dock at Onrust but such was the Mortality amongst the Native labourers while excavating the coral, that they were obliged to give it up —

Captain Leish informed me that in 1838 he went to Edam to take in Coral as ballast for his ship — Six days after, all his crew were taken ill with fever, from which two only, recovered —

Passing from Batavia, we have the same fever arising from the same cause, in the Islands of Lombok, Balli, Sumbawa, Timor, Aru &c. —

Timor

In Timor there is the Portuguese settlement of Dilli, well known to be the most unhealthy seaport in the East, the harbour is formed by coral Reefs of considerable breadth which extend along the shore at the distance of $\frac{1}{3}^2$ of a mile from the beach, the intermediate space having sufficient depth of water to afford anchorage for vessels of the largest size. —

The Reefs thro' which there are two narrow Channels

channels, dry at three quarter ebb, and therefore remain exposed from 3 to 4 hours at each change of the tides, that is to say twice in the 24 hours—

No Port that I know of, has so much exposed coral reef, and so little ventilation, and there is no Port where Remittent fever is so persistent, or so deadly as this—

This Theory applies to other parts of the Globe, and will account for the fevers of the Andamans and Maldives, Madagascar and its islands, Zanzibar and other parts of the East Coast of Africa, many of the West India Islands, and parts of the East Coast of Central America—

Coral Reef the
cause of Fever
in other localities

for instance Captain Moresby in his nautical directions page 17. thus describes the "Male Atoll" of the Maldives, "the insalubrity of the climate is particularly injurious to strangers, either European or Native, and the latter feel its effects sooner than Europeans," yet there is no swamp or decaying vegetable matter on this bare island to account for the fever; leaving only the coral reefs to do so.

The latest British Settlement is that of Fort Blair in the Andamans—the site was fixed upon by a Committee of three persons—two of whom were eminent medical men in the H. E. I. C. S.—They selected Fort Blair as apparently the most eligible and salubrious spot, and more free from marshes than any other on the island, which they most carefully

Fort Blair

examined

examined, but they overlooked the Coral Reefs in the harbour - and the mortality amongst the Convicts has consequently been fearful - one fourth of them died during the first year.

— If such a cause of fever had been recognized - either this Harbour would not have been selected, or if no better place had offered, instead of clearing the jungle close to the beach for the settlement; they should have left a broad belt of trees, and made the clearing at least a mile inland; which would have protected them from the Malaria of the Coral Reefs that surround the Islands in the Harbour.

Sumatra

I will conclude this first division of my Thesis, by giving a summary of my observations on the climate of Sumatra, which lies betwixt lat. $5^{\circ}45'N$. $5^{\circ}55'S$. and long $95^{\circ}10'E$. and $105^{\circ}40'E$. about 1000 miles in length and 60 in breadth.

It lies to the south of Eastern Asia, its shores being washed by the Indian Ocean, Straits of Malacca, and the China and Java Seas.

It has three descriptions of Coast, the climates of which differ, as well as their produce. While the interior differs from all.

Of the Coasts, the North stretching from Diamond Point to King's Point, is bold free and rocky, - its climate is salubrious - fever is not prevalent, and when met with, it is of a mild intermittent type - The produce is betel nut.

The West Coast extends from Achuen Head to Flat Point and is fringed with Coral Reefs - here, fever is very

is very prevalent, of the Remittent type and very deadly. In parts of the coast which are not fringed with the reefs, as at Padang, it is healthy - but an island called Pisang, 4 miles from that town, is fringed with coral, and where vessels lie under its lee, their crews are attacked with fever, as happened to the crew of the Schooner "Ida" who came under my care - 10 men out of 12 having been affected - the produce of this coast is Pepper.

The South and East Coasts have the same character, being flat and marshy, with large rivers intersecting them, and emptying themselves into the sea. In these coasts, fever is common, but not so deadly as in the West Coast, and the type is intermittent - The produce of these is Sago, Lattans, and Dragon's Blood, peculiar to low and swampy grounds.

In the interior, we have a country where beauty and grandeur are blended together sublime from its towering mountains, and endless forests, rich in the fertility of its valleys; - its rivers teem with life and abound in gold; it possesses an atmosphere varying according to the elevation from a little above the freezing point to the pleasant temperature of 60°.

From the accounts of those who have travelled in the interior and of one or two who have resided there, the climate appears to be salubrious and bracing - and the only feverish localities are the great valleys surrounded

surrounded by hills, where the jungle has
been cut down and the ground allowed to
become swampy, for the cultivation of rice.
Its produce is Gum Benjamin and Gutta
percha, while Gold and Ivory are largely
exported -

Part II.

On some of the Diseases of Singapore.
And their Treatment.

To attempt to describe all the Diseases to be met with, would greatly exceed the limits of a Thesis, it will therefore be my endeavour to point out any peculiarities I have noticed, and which Authors have not described; in the Symptoms and Treatment of Diseases of Tropical Climates.

Fever.

Fever in Singapore are of three classes viz. Ephemeral, Intermittent, and Remittent, in all of which the type is intermittent. In the first class you have the ^{fever} ~~cause~~ arising not generally from Malaria, but from alternations of Temperature. For instance a Native, will be sleeping in the open air, ^{and} ~~he~~ will perspire in the early part of the night about three A.M. a cold wind will blow, the body will be chilled, and Ephemeral Fever will result. The Fever is also brought on by errors of diet and frequently hangs about those who have had Intermittent Fever.

Prognosis. - favourable. In one year, 139 cases were admitted into the Convict Jail, with Ephemeral, and all recovered.

Treatment.

I have of late given Merriings Tincture of Aconite, in doses of three drops every 6th hour. in a wine glass of water, to Adults, and of one drop to children under 8 years of age. Two doses generally sufficed to relieve them. Formerly I followed the usual routine Practice of giving Diaphoretics and Purgatives but these were more disagreeable to the Patient, and did not afford such

Speedy relief.
 Intermittent Fever is the type of our Eastern Fevers, and in its true and recurrent form, is the result of Malaria, arising either from the decomposition of animal or vegetable matter. I do not think that without Malaria, alternations of temperature, can produce it; for when symptoms from such a cause do arise, that simulate Intermittent Fever, they should be considered similar to the chill and fever of an abscess, or what occasionally follows the passage of a catheter; as they do not recur with the periodicity of Fever from Miasma, nor locally affect such organs as the spleen & liver. In this fever certain Organs are affected at first temporarily; but let the Fever frequently recur, and they become so permanently — of these the Spleen is that which is most frequently affected, and the Malays have recognized the Fever, by its local affection calling it "Diman Kora" or "the Spleen Fever." Next in frequency of the organs affected is the Liver, 3rd the Lungs 4th the Brain and lastly the Spinal Chord.

It is during the cold stage, ~~when~~ these organs are affected; the Spleen enlarges, in the Right Hypochondriac Region there is a sensation of fulness; the Head aches; and a chill is felt down the back, and a wearying gnawing pain extending to the Thighs. In this stage there is a loss of nervous influence, the respirations are slow, the blood is not arterialized there is less combustion of the tissues, hence the cold —

Feeling
in the
cold stage

The hot stage follows, and the patient is relieved, when perspiration freely takes place.

Prognosis. Prognosis, favourable, in 900 cases admitted into our Ships and Hospitals 11 only died.

Treatment. Treatment, as the sweating stage invariably relieves the fit for the time being, the object of the Practitioner is to bring it on, and shorten if possible the cold & hot stages, by the use of warm clothes, hot diluents; vapour baths and not least in effecacy, an Emetic. In some cases when the headache has been severe, I have applied leeches with much benefit, and hot or cold cloths round the head, according to the feelings of the Patient. For the pain of the back and thighs, Shampooing is most grateful and effective. When there has been great Dyspnoea, the inhalation of Chloroform has been attended with immediate benefit. The fit being over, the object of the Medical Man is, if possible, to prevent its recurrence, and as the 2nd attack is uncertain, I have been in the habit of giving Quinine, the remedy for the Complaint, in three grain doses every 4th hour; when I have ascertained, that the attack has returned about the same hour as the previous one, I know that the third will likely occur, about one hour earlier, I do not therefore distribute the Quinine through the interval, but give few grains in three doses, as short a time as possible antecedent to the expected advent of the attack. This seldom fails to arrest it. The same is continued for three successive days, and if there is no

return, the Patient is safe for that month; but next month about the same age of the Moon, perhaps a little earlier, repeat the doses of Quinine or the Fever will return, and do this for three or four days, for three or four successive months. If this treatment fails it is from one of two causes. 1st An organ, as the Spleen or Liver is affected; ~~and second that~~ or the Cause which originated the Fever is still operating. If the Spleen, is the cause by its enlargement the treatment I have found most efficacious, was first to leech and apply a Blister over the organ and then to administer the following nauseous but efficacious mixture:

Modification of
Dr. Twinings.*

℞ Pulv. Khei
Pulv. Salap.
Sulp. Elat. Potass. tra ʒij
Tinct. Calumb.
Tinct. Lingib aa ʒss
Sulph. Ferri gr. xij
Aq. Menth. Pip. ʒxij. *

℞. Sig: Two table spoonfuls to be taken every morning, and repeated at 11. AM. if the Bowels have not been acted upon.

This treatment is equally applicable to Congestion of the Liver. If the Head or Spine, was the part affected, a Blister was ^{applied} ~~applied~~. When the second cause or Malaria, is still in operation, the only resource for the Patient is a Sea Voyage.

5

Remittent Fever.

Batavia Fever, West Coast of Sumatra Fever, Jungle Fever, and "Dinam Kapau" of the Malays, are all synonymous. As this is one of the most important diseases affecting European & natives in the East, I will enter into a few particulars regarding it.

It is seldom that the individual affected with this Fever exhibits the characteristic symptoms immediately on being exposed to the exciting cause. From what I have seen and learned from others, this Fever takes from 3 to 21 days before it is sensibly developed, but almost from the first the Patient has an indescribable "something" affecting him, he is rather out of spirits, feels as if there was a load upon him, and not infrequently is disturbed with bad dreams, then after three days incubation, a slight headache will be complained of, with occasional rigors, pain in the small of the back & the thighs, restlessness, slight feeling of anxiety, the countenance now wears an ^{anxious} expression, the eyes appear deeper set and lose their lustre, or glisten unnaturally. The Patient seldom complains on being asked "how he is" the almost invariable answer is "pretty well" on more searching enquiry he complains of great prostration, and exhibits perfect indifference as to his fate, but with some there is great apprehension. The skin feels warm and rough, the hands and feet are dry, the colour of the skin becomes dingy. The pulse at first is not much changed, but

6.
as the Fever advances it rises to 110 or even 120. seldom full and bounding, but small sharp and compressible, becoming more so as the Disease advances. The tongue is generally dry and brown in the Centre. The appetite is diminished if not gone, and there is great thirst. The Abdomen generally flatulent, is sometimes much distended, bowels generally inactive. Up to this time the Patient if a Soldier, will have done his work, but not with spirit and if he complains, he is put down by his Officers as a "skulker" and many a man has been brought to me as such, who has been within 48 hours of his death. A slight remission may take place, the pulse falling to about 100, the tongue becoming moist, and the heat and restlessness of the body less, but if the Fever is unchecked this amelioration is very transient. The symptoms increase in force, the headache is constant, at night there is often Delirium and shortness of breathing, the tongue becomes dry and covered with a thick crust, the lips are also dry and the articulation is indistinct, the countenance shows more of the peculiar anxious cast. The eye is more sunk and has lost its brightness, complete prostration follows. the pulse seldom falls below 120. and feels throbbing, and often intermits. The skin is still dry and tough and sometimes assumes a yellow hue, vomiting occasionally occurs. Diarrhoea may be present. The Patient can still be roused by a loud voice and if asked, "how he is?" answers better, "Have you any pain?"

No. 1. This does not last long - a little heavy breathing and slight convulsion, and the Patient is no more. The principal symptoms of the Fever may be briefly described, to be an immediate and excessive prostration of strength, an anxious expression, combined with singular apathy to his fate great restlessness, dry tongue and very slight remission of Fever. The duration of the Disease seldom exceed 9 days, though it may extend to 21. In fatal cases 4 or 5 days are the mean, relapses are of frequent occurrence, complete remission at once is seldom to be looked for, one half of the recoveries passing into Intermittent Fever, before the health is reestablished. This is the case with the same Fever of the W. India Islands. About two months ago, a Seaman was a Patient in the Hospital (Edinburgh) in Dr. Merritt's Ward, who seven months before had Remittent Fever at Bermuda. But who on admission was labouring under quotidian Ague. In Bengal the duration of Fever is less protracted. The longer the symptoms are in developing themselves, the less severe are they and the better is the Prognosis. Ships from Patavia in the S. West Monsoon, can anchor in Singapore Roads in from 3 to 5 days^{approx} and frequently not till then does Fever break out amongst the Crew. while in the N. West Monsoon when the passage is 3 weeks, the Crew are attacked on the voyage to such an extent as to disable the working of the ship.

8.
Prognosis. This Fever is not endemic in Singapore; the cases admitted into the Hospitals having been the crews of shipwrecked vessels or Annamites who had worked on the adjacent Island of "Blakantrati" where there are fringing Coral Reefs, exposed at low water. However within the last 20 years, 6 cases of pure Intermittent Fever, have presented themselves arising from Malaria produced in the island and of these four died. The Mortality in any Private Hospital, amongst those who have brought the Disease with them, from other places has not been so great, about 20 per cent. In the public Hospitals out of 49 cases ^{in 11 years} 23 died, of which 6 were Europeans.

Causes. The "Predisposing" are such as conduce in all countries to the favorable reception of Malarious matter: and need not be enumerated. The "Exciting" are Vegetable and Animal Malaria emanating from Marshes, exposed Coral Reefs, Jungles, that have been cut down & not decayed, and ground newly turned up, but the following causes adduced by Dr. J. H. Martin C.B., in his account of the Intermittent fevers of Bengal, must be taken with great reservation if any observations in the first part of this Paper are correct. "The Seaboard especially where there is Jungle, a Salt marsh, and the adjacent Islands when of a fungy or marshy nature, are peculiarly ~~predisposed~~ ^{endemic} to favor on the contrary, that the Seaboard is only unhealthy where large trees disembody themselves, or where we have fringing exposed

Coral Reef, while salt marshes are only unhealthy, when not under tidal influence and islands are not unhealthy, when covered with Jungle, unless fresh water marshes are prevalent.

Treatment Bloodletting I have long abandoned; for nearly 10 years I have not performed venesection, and certainly never more than 2 or 3 times during the last 20 years in Remittent fever, and that is the commencement of my practice in the East, when the rapid fatal termination of the cases, taught me a lesson. When however I have got a patient of Plethoric habit in the first stage & complaining much of headache, I have not scrupled to apply a dozen leeches, which with the evacuations I calculated abstracted from 12 to 15 oz. of blood, but I had seldom the opportunity of so early treating a patient, If the tongue was moist I gave Quinine & Lami's powder, with Dover's Powder to allay restlessness, if it was dry the Dover's Powder was omitted; if the stomach was irritable the Lami's Powder was dispensed with; and the Quinine was combined with Calomel in the dose of 3 grs. of the first with 1 grain of the last, given every 4th hour. If a remission took place the Quinine was given alone, or with Dover's Powder. The bowels were kept open by the Calomel; failing that, by Emetics, but if the Quinine could be administered for a

short time. If of the Croup? Powder of Salap,
by procuring two copious stools, always
afforded relief. If the head was affected
the Quinine was still given combined with
the Calomel, but a Plaster was always applied
to the nape of the neck while cold clothes were
applied to the top of the head. The Calomel
was given not to produce salivation, but to
prevent the action of the Quinine on the head,
and to promote a free discharge of Bile which
in several instances I have seen critical, that
is to say after a bilious motion, resulting from
the use of Calomel, the Patient has almost im-
mediately lost the frontal headache, the feel-
ing of weight & pressure on the eyeballs, the expres-
sion has improved, and the Tongue become moist.
During this time, the patient craves for drink
when rice water seasoned with a little salt will
be found most grateful, then tea and lastly beef
soup. Solid food is unfit for the patient and
I have known during convalescence a relapse as
the result of a dinner on roast chicken. During
the short duration of the disease the combus-
tion of the tissues has been great, and the patient
whether he lives or dies is fearfully emaciated.

During convalescence great care must be taken
of his diet, wine ought to be given when the Tongue
is moist, when dry, if has done more harm than good
is my practice; but towards the last when there
is great prostration, Wine & brandy may be given
without much harm, but with little prospect of good.
Why not give wine from the first to prevent the
great prostration of strength? If it could, I would
administer it, but the prostration of Physical power

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is not so much the result of muscular weakness and consumption of the tissues, as the effects of the disease on the ~~tonicity~~ ^{tonicity} of the nervous system; reduce the fever and you restore the ~~tonicity~~ ^{tonicity} with the feeling of power, that I have never found to follow the use of wine given indiscriminately; as mentioned, a bilious motion or good perspiration will do more to remove the feeling of prostration than full and stimulating diet.

Pathology To this I can add nothing to what has been written, I have examined many bodies, without being able to satisfy myself what was the immediate lesion that caused death; for in many I saw nothing abnormal; but with more correct powers of observation and the assistance of the microscope more may be done.

Cholera The next disease of the Symptomatic class on which I have a few observations to make is Cholera. Within the last 20 years, it has visited the Straits Settlement three as an Epidemic, the first was in 1841, the 2nd in the latter end of 1848 & the third was in 1854. During these Epidemics I noticed that Influenza or a feverish state of the system attended with local irritation of the mucous membrane of the nose, fauces and Larynx preceded the two former and all were preceded by slight cases of Diarrhoea, not confined to those who were subsequently attacked by Cholera. While the Epidemic lasted many cases were treated as such, which were merely cases of Diarrhoea attended with great fear. In 1841 the native population suffered severely, no less than 3000 of the Hottentot Chinese died from it according to their returns many Malays perished, but a class of

Malay, called "Bojans" who lived together in one
 bailpang or baidup, 20 or 30 inhabiting one house &
 these houses built near a canal or river, suffered most.
 The servants of Europeans who lived within a few
 yards of their masters & some even who lived in
 the same house were attacked & died of Cholera
 yet not one European on shore. In the
 harbour the crews of only two vessels, the "McCricker"
 & the "John Dugdale" were attacked, in each 3
 men were seized and all died, at my recom-
 mendation they changed their anchorage and
 no others of the crews suffered. In the other
 Epidemics, the European residents escaped
 altogether, and only a few seamen were af-
 fected while lying in the miserable grog
 shops of the Town. To what is the immunity
 on the part of the Europeans to be ascribed?
 To their naturally strong constitutions &
 to their greater use of nutritious animal
 food & stimulants. The reasons I should
 assign as most likely for these seamen being
 attacked were the probable presence of scurvy,
 and their intemperate indulgence in uter-
 icating liquors. The fact of the immunity
 of European residents during an Epidemic
 of Cholera is most important in the Etiology
 of this complaint, and ought to be taken into
 consideration amongst the preventive measures
 on the approach of this Devastator.

In the treatment of this complaint I have tried in treatment
 seen almost every known remedy and had to confess
 the utter worthlessness of Physic when given in cases a
 little advanced. At last, towards the ^{end} of the last
 Epidemic on considering the pathology of the complaint,

and believing it to be, the result of Lymotic influence exerted on the great nervous centres of ^{the} intestine, producing such a relaxation of the coats of the capillary vessels in the intestines, as to permit of the escape of the liquor sanguinis or Serum, which mixed with epithelial cells from the rice-water stools, that the collapse, and death are the result of serous hemorrhage, and that in severe cases, death may result from the primary injury to the great nervous centres without the serous discharge. Knowing from experience that in internal sanguineous hemorrhage, there was no remedy equal to Turpentine, I thought of trying it both by the mouth, and by the anus. By the mouth I gave it frequently in 3j doses mixed with Brand's and the white of an egg, every hour at first, then every two hours, and last every 4th hour, and by the anus it was administered in the following manner.

Rj. vitelli Ovi. No. iij

M. Terelinthinae 3 ~~ij~~

Sig. Q. S. Ampuli; na 3 x iv. No.

One third of this to be injected into the great intestine, by a Stomach Pump tube every 4th hour, while this was being done the Patient lay on his right side, the tube was warmed, greased & made very flexible, and was carefully introduced about 2 feet into the great intestine after the tube was extracted, the nates were kept together for some time to retain the injection after the tube was ~~extracted~~. During all this time the Patient was rubbed & shampooed, hot applications were used, and over the Epigastric region I frequently blistered with liquor

Ammoniac applied by means of a piece of Lint, covered with oil, silk or Guttapercha. This would treatment I found more successful than any I had tried, but I will not give it forth as a cure, far less a specific for Cholera, as I only commenced it towards the end of the Epidemic, when any kind of treatment would have been more successful than at an earlier period, & secondly the number of cases were not sufficient to convince me of its undoubted efficacy, but that it was superior to any other treatment, was my impression, and I submit it to the criticism of my superiors.

The eruptive diseases in the straits are all of a milder type than we have in this country, with the exception of small Pox. Diseases

The diseases are, variola, varicella & rubiola. Scarlatina has not yet appeared.

In regard to small Pox it is the great bane of the natives, & is fast exterminating the Malays. So that if government are desirous of preserving that race; compulsory vaccination should be extended to the Eastern Settlements. In the adjoining island of Java the Dutch have for years compelled all natives to be vaccinated, and the Malays of that island have increased since the English left it in 1817, from 5 to 1,000,000, while in our settlement they have increased a little, not by reproduction as in Java, but by immigration. Whooping Cough is so much as scarcely to assume the spasmodic character it does in this country. On the whole the climate of Singapore is very favourable for infantile complaints, and it is the general

desire of all parents, that their children should have such diseases before leaving ^{for} a colder climate.

Affections of the Mucous Membrane are on the whole more common than ⁱⁿ a temperate climate, with the exception of those of the Larynx, Trachea & bronchial tubes. Coryza or irritation of the Mucous Membrane of the Nose and frontal sinuses, is a very common affection, & is produced most frequently from sudden chills or from the draught of a Pauda, and in some from the Saba wind, i.e. the wind from the S.W. which flows from the coral & at islands. This is a most troublesome affection but its treatment is simple, either a brisk saline purgative, or a full dose of Morphia on going to bed.

Diphtheria Towards the end of 1856 or commencement of 1857 Singapore was visited by an Epidemic of Diphtheria, which had travelled from Calcutta through the Tenasserim Provinces to Penang, Malacca, Singapore. It presented the usual character of a brown false, membranous exudation lining the fauces & Larynx, fetid breath, great prostration of the vital powers, and a loss of the powers of assimilation by the Chyl. & Pech. viscera. Many died in these countries, in some instances whole families were swept away, & I lost at first a few Patients. The plan of treatment I found most efficacious was to wash the fauces with a solution of nitrate of silver, Nitric acid & water. If the patient was old enough, I have ordered him frequently to inhale the steam of hot water, & a dose of Hydr.

Creta with Pulv. Doveri was given at bedtime, & a purgative of Rhubarb Tart and Bicarbonate of Potash in the morning, so as to produce two or three motions, that were often very fetid, after which I gave the solution of the Sassa Nitrate of Iron in doses varying from 20 to 40 drops every 4th hour. Anhiations diet was frequently administered, & in some cases introduced by the anus. With this treatment I was very successful.

Diarrhaeae ^{& Dysentery} are frequently met with, not so Diarrhaeae much amongst the residents as among the [&] Dysentery floating population of the harbor. Amongst the residents it is not the effect of any malarious influence, but in the majority of cases is produced by alterations of Temperature, checked perspiration, errors in diet & disease of the liver, the latter is a very frequent cause for in nine tenths of the affected gentle pressure over the epigastric region a little inferior to the Cartilage of the 4th rib, will create pain indicating an abnormal state of that organ. In many cases of Diarrhaeae & Dysentery I commenced with a purgative consisting of Calomel & Dover's Powder at bedtime, as in the following prescription

Rx:

Sub. M. Hyd: gr. vi

Pulv. Dor: gr viij vel x

Ext. Gent: q.s.

ft mass et div. in pile: q. h. S. S.

is
loga
men

Rf.

Pulv. Salap co. ʒij

Aq. Mint. Pip 3 ʒij

ft. Waustus

Sig. to be taken early in the morning.

Very little more Medicine is required in Diarrhea except perhaps a little Dover's Powder at bedtime & three times daily a Sherbet made of Rose Water & the fresh Pulp or preserved fruit of the "Ogle Marmalas" called also "Paal Fruit" and "Wood Apple". In Bengal it is taken as a daily beverage in the form mentioned, & where there is costiveness, acts as a slight laxative, but in Diarrhea & Dysentery it solidifies the stools, without being an astringent.

In ordinary Diarrhea after a purgative no other medicine is required, than the "Paal", and it powerfully assists other medicines in the cure of the severe forms of Diarrhea and Dysentery. But great attention must be paid to Diet which should be nutritive easily to be digested and by no means bulky: meat, beer, & fruits are positively injurious, Farinaceous Food in small quantities with milk; & the essence of beef, are all that should be given, & perfect rest is to be enjoined.

In Dysentery, in addition I give three grain doses of Ipepacuanha made into Pills, every 4th hour with the best effect. Sometimes apply leeches over the Caput Venerum Velli. or over the verge of the 7th rib and always blister over these parts.

There is an ulceration of the rectum within an inch or two of the anus, which often

deceives practitioners as it is attended with many of the symptoms of ~~Acute~~ Dysentery especially by the "Tentismus". A digital examination can often detect a roughness, the blood that passes is not so much mixed with the feces as in Dysentery, but comes last and is seen in the top of the motions. In children it causes "Prolapsus Ani". Its treatment is most simple, 10 grs of Nitrate of Silver dissolved in $\frac{3}{4}$ of water, half of which is to be injected, night and morning, will cause a few hours suffering, and cure the complaint. In this climate from the frequent abnormal state of the liver Hemorrhoids are a very common complaint with Europeans, so common that I think it must affect two thirds of the community. To the ordinary practitioner it is often difficult to decide on the proper mode of treatment; excisions & ligature require the patient to be confined to the house for some time, and are not always free from danger & pain. The application of Caustic externally is slow and troublesome, and in the case of internal Piles is attended with great pain. To avoid pain & to enable the man of business to attend to his business at the same time effectually to remove the Pile, I have originated the following mode of treatment after a careful consideration of what a Hemorrhoid was.

The patient having had his Bowels ~~their~~ ^{their} cost regulated upon was required to press out the Pile if internal, if external I grasped it with my thumb and forefinger of left

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hand, so as to distend the lower part of it & to tighten the skin, then I introduced a narrow, sharp pointed curved bistoury, so as to reach the root of the pedicle & by one or two revolutions divided the vessels as they passed through, on taking out the bistoury a little blood flowed, the pile was squeezed, so as to empty it of as much blood as possible, a piece of Nitrate of Silver pointed and made very fine by rubbing it on a piece of moist chamois skin, was now introduced through the opening made by the bistoury, to the root of the Pedicle, when it was, rotated and withdrawn, a piece of lint was applied, and nothing more was required. In two or three days a slough could be pulled out, when the Pile shrivelled up, and the patient was effectually relieved. I have not known of such a mode of treatment to be applied to Hemorrhoids by any other surgeons, but I can vouch for its success, having now practised it for 15 years. One of my first Patients operated on in 1846 is now the head of a large Mercantile firm in London, and since has not been troubled with this complaint though previously it had affected his health very much, and so engaged was he in business, that he could not spare a few days, considered by me at that time necessary for the removal of the Pile by Ligature or excision, my last operation was upon a lady who stopped in 1858 at Singapore on her way home from Siam, she was in her 6th month of pregnancy.

and much afraid of a premature coarctation, owing to the great contraction of the uterus produced by the irritation of the hemorrhoids I performed the operation as described, she felt little pain and no subsequent annoyance and was effectually relieved of this troublesome complaint. With the exception of affections of the mucous membranes of the air passages all diseases of other mucous membranes as of the Genital & Urinary organs the intestines, eyes, & ear, are apt to assume a chronic form, difficult to get rid of, in the relaxing climate of Singapore; In fact I have known a simple Gonorrhoea resist all treatment, and only removed by a change of Climate.

Diseases of the Respiratory organs are very rare in this climate with the exception of Coughs. The following table which I drew up some years ago, favorably contrasts Singapore with other countries.

Diseases
of the
Respiratory
Organs

	Cases of Phthisis	Cases of Consumption	Ratio of Phthisis to Consumption	Cases of Phthisis	Cases of Consumption	Ratio of Phthisis to Consumption
Lands End Worcester	413	3086	1 in 7.5	1802	1 in 25.3	
Plymouth	176			5648	1 in 32.	
Birmingham	295			1866.5	1 in 63.9	
Glasgow Town	202	2502	1 in 12.4	30.000	1 in 148.5	
Singapore	49	287	1 in 5.8	7586	1 in 154.4	

From this we see that in 7586 Patients admitted into the Hospitals at Singapore the proportion of diseases of the lung to admissions was 1 in 26, of Phthisis to diseases of the Respiratory Organs 1 in 5.8,

of Pthisis to total admissions 1 in 154. A.
 In a warm & equable climate like Singapore
 where the nights generally are so cool that re-
 freshing sleep can always be obtained by
 the healthy, with time in the morning &
 evening for exercise, the Appetite is good,
 and the food can always be assimilated,
 hence tubercular degeneration of the tissues
 is not a usual complaint, when such a state
 does occur the lungs are not the organs affect-
 ed, but those which the climate has over-
 burdened with work, such as the liver,
 through it the intestines, & lastly the skin.
 While this climate is I believe favourable
 for those who are predisposed to diseases
 of the Lungs, I consider it to be the last
 place that ought to be sought by the
 Patient who has Pthisis in an advanced
 stage, owing to the relaxation which the
 continuous heat & moisture cannot fail to
 produce, while the weak state of the patient
 precludes him from taking active exercise
 indispensable to health in this climate.

In Worcester Dispensary of 235 cases of
 Pthisis, 62 died. 1 in 3.8 Birmingham 1 in
 3.8 Singapore of 49 cases of Pthisis 40 died
 1 in 1.25. These 49 cases were all Seamen,
 received from their ships in the last stage
 of the disease. In the course of nearly
 20 years practice I know of only 2 cases
 of Pthisis in Europeans in whom the disease
 originated in Singapore, these were two
 sisters who after having had several children
 very rapidly, were attacked with its symp-

towns, one went to Great Britain and died, the other remains and enjoys pretty fair health. All the other members of that family, except two brothers who were in India, have died from Phthisis at an early age. Pneumonia, Pleuritis and acute Bronchitis are almost never seen amongst the residents; occasionally we have opportunities of seeing these diseases in Seamen who bring them to the Port.

Diseases of the Circulatory System are not Diseases of so frequent occurrence here as here, chiefly ^{of the} Circulatory System on account of the lungs being less liable to disease, and the like amount of mental causes, not being in operation. I need not dwell on the subject as I have no new observations to make.

The same applies to diseases of the Kidneys not common among European residents. Indeed I have only seen one case of Bright's disease where the symptoms were verified by the post mortem appearances.

This does not apply to the Chinese who from the frequent abnormal state of the Urine I have no doubt are affected with Bright's disease, but as yet I have not ~~yet~~ had opportunities of verifying this observation. The secretion of Urine is subject to frequent changes from the normal state, and in theumatic habits in two instances I have known the irritation from the excess of salts so great, as to produce inflammation of the urethra and Mucous Membrane presenting a difference in appearance, from what is presented in the specific inflammations of Gonorrhoea, except that a little medicine

which corrected the Dyspeptic symptoms & diminished the excess of salts, relieved the symptoms & effected a cure. In the class of diseases of the Genitals there is one not to be met with in this country, nor have I known it described by any ~~author~~, though possibly it may be.

Aguish It is an inflammatory swelling of the ^{Scrotum} ~~Inflammation~~ accompanied with fever, assuming a periodic ~~Scrotum~~ form. I have seen it commonly amongst natives especially Chinese, but also in **Symptoms** two Europeans. The symptoms are ~~rigor~~ followed by fever a painful tension of the scrotum which gradually enlarges by a thickening of its coats, so that I have seen it reach the size of a child's head.

The skin intense smooth & glistening, red & hot to the hand, ~~and is described by the patient~~ as burning, the fever is also most acute, the patient is effectually prevented from pursuing his ordinary work, and is forced to lie in bed with a support in the shape of a pillow, to the enlarged scrotum. After some hours the pain diminishes, the swelling becomes less tense, and the patient feels slightly relieved, when a rigor again sets in, followed by fever and the symptoms return, with all their former severity.

It may either terminate in resolution or sloughing, the latter occurred to one of my Chinese servants who had ^{been} frequently relieved by me before. I left Singapore - but this infatuated youth having squandered away to a great extent during my absence,

was lodged in Jail where proper attention could not have been paid to him, as on a return of his complaint, sloughing of the scrotum ensued, arterial hæmorrhage followed, & one morning he was found suffragone as shortly afterwards he expired. When resolution takes place there has occurred in one of my Patients great exudation of a clear fluid from the skin to the extent of a pint nightly.

The treatment I have found most effectual was to consider the disease as of an ⁱⁿflam^mentary type with a local inflammation. In all the patients I found the biliary organs much deranged. The medicine I administered was Quinine accompanied with a little calomel every 4th hour, with leeches & hot fomentation to the Scrotum.

One of my patients thus wrote me from Singapore on the 5th February 1860. "I have of late had 2 or 3 smart attacks of my old complaint, but have, 'Thank God,' by following your advice got relief in 3 or 4 days at the utmost, by taking large quantities of Quinine & using Scalding baths from which I derived more benefit than from any other thing and shall always gratefully remember your advice." In this

patient the discharge of Clear fluid, took place to the extent of a pint ~~annually~~ nightly & with great relief to his suffering. In all these cases as soon as the fever was checked by the Quinine the local inflammation diminished & the parts returned nearly to their normal size. To enumerate the diseases of the liver and describe their symptoms and the treatment would far exceed the limits of this paper. I shall merely allude to one whose frequency & fatality in tropical countries claims our attention viz "Obstructed Abscess of the Liver". This complaint is not so frequent in Singapore as in the adjacent countries of Bengal & China. Europeans. Native in either place are seldom affected with it. The causes are high living, high temperature with alterations of heat & cold & the neglect of exercise & checked respiration. I have known it so insidious in its approach

of the liver
action

as to be unsuspected by the Patient, whose health was so little affected, as not to alarm him sufficiently, to induce him to seek Medical Advice, until after a slight debauch symptoms of acute inflammation set in, which no treatment relieved. All at once the Patient complained of fearful abdominal pain, collapse set in such as is seen in the last stage of Cholera, and the Patient died a few hours after. On dissection there was found a large deep Abscess in the right lobe, which had evidently been of long standing from the thickness of its walls. After the excess mentioned, inflammation had commenced, for which advice was sought. The Abscess in spite of the treatment reached the surface, and at last burst into the Peritoneal cavity, accounting for the sudden pain collapse and speedy dissolution.

All abscesses do not end so, some burst into the Colon and of these one half recover, some make their way through the lungs, and one third of these recover, others into the Stomach, while others pointing externally either burst or are opened. Whenever I have suspected the existence of an Abscess I have discontinued all Medicine with the exception of a slight laxative, and enjoined perfect rest, and the mildest diet that was at the same time nutritious, and as food suited so well apparently as Oat meal porridge and Milk. If an abscess bursts, others may ~~form~~ and subse inflammation may give rise to others ^{quicker} before the Cure is effected; to prevent this as much

as possible, I have been in the habit of passing a ~~stone~~ into the side, pretty deep & broad. and I consider this has been attended with much benefit.

One other glandular disease only. I shall allude to, on account of one of its symptoms and that is ~~Cancer~~ involving the Pancreas and Duodenum, and in one case also the cardiac extremity of the Oesophagus. In these cases in which the Pancreas was involved, I noticed ~~it to be~~ in the defecta numerous fatty bodies for the origin of which I could not account, until I heard Dr. Bennett lecture on the Pancreas & his observations on the experiments of Mr. Bernard on that organ.

Diseases
of the
Nervous
System.

In tropical climates, and in this particular under investigation, diseases of the Cerebro Spinal Axis are certainly more frequently to be met with than in more temperate regions. The particular diseases I allude to are Delirium Tremens, Tetanus, Hydrophobia, Softening of the Brain, leading to Apoplexy, and Paralysis. and of that Reflex action in first pregnancies, where the excited Uterus causes such irritation of the Stomach, & vomiting so severe, as to require abortion to be produced, lest Death should ensue. In taking a retrospect of my practice for the last 20 years. I can safely state I have lost from this class of diseases, 60 per cent of my patients. In the first disease Delirium Tremens, even of hot more than climate were the causes, while Softening of the Brain. depends more upon the Climate than

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upon errors of diet. Tetanus. Hydrophobia
and the vomiting of pregnancy. as well as
many other nervous diseases. were exagge-
rated in their force. and the constitutions of the
Patients were rendered more susceptible and
predisposed to be affected by their exciting
causes, from a febrile state of their nervous in-
fluence, ~~and~~ the result of a high and uni-
form temperature. Now this high and uni-
form temperature acts is not known, but I
feel convinced it must be through some change
in the electric currents of the Body and if
Experiments could be made in these cases on
patients so affected, by the delicate electrometers
lately exhibited by Dr Bennett, I have no
doubt valuable information on the changes of
the electric current of the body when affected
with these diseases, would lead to a more cor-
rect knowledge & treatment of them. In
Delirium Tremens. I have found the treatment
by Tartar Emetic & Tinct of Opium answer better,
than when either Opium or Brandy were given in
large doses separately. or conjoined. In Tetanus
I have found no remedy better than another,
and in Hydrophobia the same. In the latter
complaint I have had many opportunities
of trying Medicine in the most heroic doses.
but without avail. Chloroform relieved the
Patients much, stilled the disease of much
of its terror, but without delaying the fatal
event, smoothed by its insensibility the
Spirits exit from this world. In one case that of
a fine boy. where I was led to fancy the irritation
might have been resident in the cicatrix in order to

to separate it from the Cerebro Spinal Axis. I divided all the nerves of the arm, but without arresting the Paroxysm, or retarding the fatal issue. While we cannot cure this awful disease, we can prevent its occurrence, by the extermination of all Pariah Dogs, which without Masters, ~~are~~ are all fed as to quantity & quality of food, & ~~which~~ ^{which} abound in all Eastern Settlements. The Police by killing all dogs found in the streets the first three days of every month, soon diminished their numbers, and the disease for years disappeared. But on this rule being relaxed, the numbers of dogs again increased & the disease reappeared when I brought the subject officially before Government, and stringent measures were again adopted with the like good result.

Rheumatism & Neuralgia are diseases very common in this climate. And evidently from the high susceptibility of the Nervous System to the slightest impression, from the checks that are often given to the sensible perspiration by draughts of air, and to the imperfect assimilation of the food. When the Neuralgia is local & (in many other affections) I have found the external use of Chloroform in the manner first described by me in a Paper read before the Medical Chir. Society Edin most effectual. It consists of soaking a piece of lint about the size of a Florin, & covering it over with a watch glass, retaining it in its place for about 10 minutes, by the warm hand, when after so much irritation will have been produced, as to vesiculate, the combination of

Counter irritation and Anesthesia thus produced, frequently removes at once all local pain. In some severe cases the application may require to be repeated, as in a case of Rheumatic Inflammation of the eyes, where I was the sufferer, the pain came on at a certain hour, so severely as to be almost unbearable, for the relief of which opium externally & internally, Belladonna leeches, Blisters &c &c were of no avail, but chloroform applied in the manner indicated, to the temples in 10 minutes removed the pain, & on its return next night the same application was used till complete relief was obtained.

Sun
Apoplexy

That the Sun's rays in Singapore must be much tempered in their calorific force, may be inferred from the fact of Europeans being able to move about, during the day with impunity with only a thin umbrella over their heads, I never knew a resident except one attacked by "Sun Apoplexy" and he was a stout puffy little man, who would insist on running after the Chinese in the Jungle, during a disturbance, after drinking several bottles of beer. I have treated several seamen who were seriously ill from exposure to the sun while scraping ships sides and caulking but none died in my practice, if the disease was not complicated with Delirium Tremens.

Diseases
of the
Skin

Diseases of the Skin, take the place in frequency and universality of diseases of the respiratory organs in colder regions. When the blood becomes diseased in Singapore

it is the skin that bears the burden, and eliminates the morbid matters, as the kidneys do in cold countries. Amongst the ill fed poor, Leprosy, Psoriasis & ulcers of all varieties prevail, filling the Pauper Hospital, and swelling the mortality table, while in those who are better fed, boils & carbuncles are only too common, Ringworm in a variety of forms attacks at one time or another, every native or European resident, but the remedy is at hand in the leaves of the "Cassia Alata" which bruised & rubbed on the part will remove the disease in a few days, if it has not become chronic. I am sorry that the scope of this paper has prevented me entering into details, and doing justice to the importance of the subject, but I trust the new doctrines I have broached will be found consistent with the truth, and may elucidate much that was mysterious in the climate of Tropical Countries

A. Little