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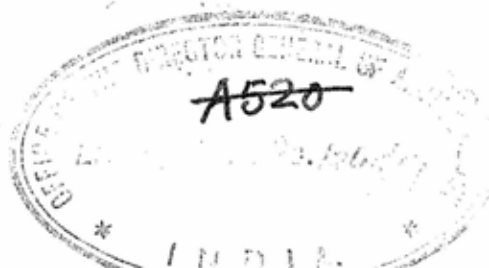
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BANGKOK

THE SIAM SOCIETY.

(FOUNDED 1904.)

For the Investigation and Encouragement of Arts, Science and Literature in relation to Siam and neighbouring Countries.

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HIS ROYAL HIGHNESS THE CROWN PRINCE OF SIAM.

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The Society does not admit any responsibility on its part
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In transliteration each author has followed his own system.

CLIMATE AND HEALTH
IN BANGKOK

BY

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And

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The Climate of Bangkok.

Bangkok, the capital of Siam, is situated on both sides of the river Menam Chow Phya, some fourteen miles as the crow flies from the bar. It is only a few feet above sea-level in latitude $13^{\circ} 58' N.$ and longitude $100^{\circ} 34' W.$ With the kingdom of Siam in general, it is protected from violent changes in weather by reason of the high mountain ranges on its borders which cut off the effects of the cyclones so prevalent in adjacent countries.

The predominating influence in our climate is, of course, that of the monsoons. The North-east monsoon sets in early in November in the Gulf of Siam, but in Bangkok its influence is not usually felt until the middle of the month has been passed. The evenings are then delightfully cool and the minimum temperature may fall to 66, 64, or even to $62^{\circ} F.$ as on the 19th November, 1904. The coolest portion of the twenty-four hours is between 5 and 6.30 a. m. By 9 a. m., however, the thermometer will be found above $70^{\circ} F.$ and in a good cool season not higher than $75^{\circ} F.$ Until between 3 and 4 p. m., the temperature steadily rises to a maximum even in our cool weather, of 88-90-and even 93.

The mean temperature during November, for the past four years during which I have taken observations, is 79.8, but Dr. Campbell gives 76.8 for 10 years. Rain usually falls in a few showers during the early part of the month, the mean rainfall being rather over 2 inches.

December is throughout the coolest month of the year, the average mean temperature for four years being 76.3. Although hot during the day time, the atmosphere is dry and bracing and the nights are cool, the mean of the minima being 66.1 F. The average rainfall, which consists of a shower or two about Christmas day, amounts to only about half an inch.

January is pretty much the same as December, but towards the end of the month the thermometer begins to gradually rise during the day although the nights are still cool. In the early part of February, the minimum temperature may be still below 70, and even as late as the 14th Feb. temperatures of 56F. may be recorded but, as the month wears out, the real hot weather commences.

During these four "cool" months—November, December, January and February—there are several important factors which make for health. These are: considerable dryness of the atmosphere, low night temperature and a very considerable daily range of temperature between the shade maximum and the shade minimum. This daily range of temperature is a most important item in climate for even although the maximum day temperature be high, provided there be a considerable fall towards the minimum, the variation gives a fillip to the system and restful nights are assured. The average range for these four months is 16° , 24.6° , 22.4° and 19.3° respectively.

March in its warmth is the precursor of April which is the hottest month of the year, the mean temperature being 86.95° as compared with 76.8° for December. The highest maxima are now recorded as for example 102° F in March 1902, 104° F in April 1905, and 104° F in May 1903. The nights are hot although as a rule there is a fairly strong breeze from the sea. It is the exception to see a perfectly dry April. Dark clouds are seen to bank up now and again especially to the North of the city and heavy showers of a short duration, preceded by an oppressive sultry hour or two and accompanied by thunder and lightning are the welcome harbingers of the coming monsoon. On the 7th April 1904 hail fell in Bangkok—a phenomenon which according to Dr. Campbell, is seen once in fifteen years. The average rainfall for the month is about $2\frac{1}{2}$ inches. May brings the South-west monsoon with the first of the real rains, the average rainfall totalling 10 inches with a mean of 14 days on which rain falls. From now on until the end of October, the rains continue, the averages for June being 5.6, for July 4.1, for August 5.9, for September 13.9 and for October 8.1. During these wet months, the mean temperature remains almost uniformly at about 85° F, the days are hot and moist and the minimum temperature rarely falls below 75° F. The daily range too, which is so extensive even during March and April, now amounts to about 15 degrees. During November, the rains cease, and the North-east Monsoon breaks in, commencing the cycle which has been just-described.

To put the matter of the climate of Bangkok in a nutshell, I would draw your attention to the graphic chart plotted on Plate 1. The black lines give the result of four years personal observations, the dotted lines the mean of ten years observations made some twenty years ago by Staff-Surgeon J. Campbell R. N., a former physician to the British Legation. You will note that the mean of the maxima as well as the absolute mean figures differ throughout by about two degrees although in their uniform course they tally in a remarkable manner. The mean of Dr. Campbell's minima, however, give a higher figure than my observations do. Why is this? Has the climate of Siam undergone a change since the early readings were made with the result that during the hot weather, the thermometer now registers higher figures and during the cold weather, the temperature falls lower? My own opinion is that the difference depends upon the site of the thermometers and that Dr. Campbell fixed his instruments in the verandah of his house and not in the regulation louvered box in the open, as the location of my instruments. From experiment, I find that this makes a considerable difference in the readings, the maxima in a house never rising so high as in the open and the minima never falling so low, hence the red line now shewn. However, you will note that the lowest mean temperature occurs in December, that April is the hottest month of the year, that the highest temperature has been recorded in May *i. e.* 104° F and the lowest in December and January *i. e.* 56° F., that the wettest month is September, the driest January and that the greatest daily range of temperature is found during January while the mean temperature for the whole year is 81.6° F and the mean annual rainfall 54 inches for 4 years with me and 67 with Dr. Campbell. You will see then, that although the climate of the place is not a suitable one for European colonisation, it is not such a bad one after all as subtropical climates go. Why Bangkok has gained such an unenviable notoriety as a perfect death trap for Europeans is not due to the climate itself but to certain conditions which partly depend upon climate and partly upon the want of initiative on the part of the Siamese Government with regard to schemes of Sanitation. One of the most remarkable of the many striking results of the

Scientific study of Tropical Diseases is the recognition of the fact that Climate as a factor in disease has been robbed of many of its old terrors and that much of the sickness of Tropical countries can be lessened, if not entirely done away with, by Sanitary measures. Given a pure water supply and an efficient method of drainage, Bangkok might well develop into one of the healthiest cities in the East.

Selection of the most suitable men for such a climate as that of Bangkok.

This is naturally a most important matter not only to the intending new-comer himself but also to his employer. It has been my lot to send home several men who should never have come to this place. They have made a brave attempt to fight against their disabilities but the end has only been a disappointment to themselves and a pecuniary loss to their employers.

The best way then, to describe the proper sort of man, will be to show what diseases or bodily conditions are likely to be unfavourable in this climate.

Anaemia or poorness of blood handicaps a resident in the Tropics at once. It is a well established fact that a physiological or natural anaemia is soon established in us all in hot climates, no matter how full blooded we may be on arrival. When this does not go too far, it makes for health and comfort by lessening the chance of headaches, sunstroke and many other diseases. After prolonged stay in the tropics or as a result of many of the climatic diseases, anaemia may develop into a veritable disease. It is well therefore that persons of an anaemic type should not select the tropics as a field for a career. Another unfavourable condition is a tendency to diarrhoea, constipation or bowel complaints generally. Owing to the fact that in the tropics, the abdominal organs, in Europeans, are in a more engorged condition—that is, they are relatively fuller of blood—than in temperate climates, and further, as the chances of sudden chills due to rapid changes of atmospheric temperature, thinner clothing and a more active skin, are greater here, we naturally find that bowel complaints are very frequent amongst Europeans. A tendency to diarrhoea may predispose to

Chronic Tropical Diarrhoea or Sprue, to Dysentery and even to Cholera or Typhoid Fever.

Constipation, on the other hand, may be just as great a cause of sickness as Diarrhoea. Here in the Tropics very few Europeans enjoy an active outdoor life. The rule is rather a sedentary occupation which keeps one indoors until four or five in the afternoon when there is only left time for an hour and a half or at most two hours exercise before sundown. The consequence is that a sluggish state of the bowels arises which causes a condition of chronic poisoning of the system. The functions of the liver and kidneys become deranged, digestion suffers and one's mental faculties deteriorate. How often have I seen men of this type who were melancholy, irritable in temper and unable to concentrate their attention on their business. They are in fact a nuisance to themselves and their friends and a source of monetary loss to their employers.

The only thing to do with these men is to send them home.

Of Lung complaints contraindicating residence in Bangkok, Phthisis Pulmonalis and Asthma may be mentioned.

A strong family tendency to Pulmonary Consumption makes one very chary, while the actual presence of the disease should emphatically forbid the passing of such a person. In Bangkok, my experience is that Phthisis Pulmonalis is a very common disease amongst the Siamese and in them often runs a very rapid course, but it is nothing to what one now and again sees in Europeans, especially young adults. In them the disease can truly be called Galloping Consumption and the only chance of prolonging life is immediate change to a temperate climate.

Asthma is a disease of surprises. It may be a torture to a man in an excellent climate and yet disappear while residing under what one might consider adverse circumstances. Nevertheless, I would not counsel an asthmatic subject to come to Bangkok. The disease is common amongst the natives and I have found that Europeans subject to it, suffer badly in this low lying, damp spot.

You will all agree with me that the longer one lives in the Tropics, the more one's "nerves" seem to suffer. It will therefore

be at once apparent that any condition suggesting instability of the nervous system or any actual disease of the same, should contraindicate one coming East.

The condition of the teeth, too, is an important factor to be reckoned with.

No one should come to Bangkok with teeth in an active state of decay, or with so few sound teeth that thorough mastication of food is an impossibility. The presence of unsound teeth has been definitely proven to be the cause of pernicious anaemia in temperate climates. In Tropical climates any additional tendency to anaemia should be avoided. Further, the inability to thoroughly masticate one's food is a serious drawback in Bangkok where one has to tackle tough beef and tougher and drier fowls. If a good dentist cannot provide an efficient substitute for lost teeth and cannot at the same time arrest decay in teeth still in the patient's mouth, such a candidate for the East should not be passed.

An important point to remember but one which is too often neglected is re-vaccination. This has been brought more forcibly to one's attention during these past two years in Bangkok than any years I have spent here. Quite a large number of Europeans have suffered from Small-pox and one fatal case at least has occurred. How much trouble and even disfigurement would have been saved had all these sufferers resorted to the simple precaution of re-vaccination. In Europe where fortunately Small-pox is now so rarely seen; revaccination is advisable every seven years. In a country like this where one may often actually rub against persons in the most infectious stage of Small-pox, the neglect to have oneself frequently vaccinated is, in my opinion, little short of criminal folly.

Another precaution in the way of prevention of disease may be mentioned. I allude to inoculation against Typhoid Fever. Although the system is by no means perfected and the protection afforded is infinitely less than that obtained by vaccination against Small-pox, still the results have proved satisfactory enough to warrant one giving the inoculation a trial especially in the case of young adults.

Age at which one should come to Bangkok.

Now, what is the best age at which a man or woman should leave home for these parts ?

Well, it is a matter of proved experience that young adolescence is not a suitable time for arrival in the East.

Although one may call to mind many cases of young people who have taken kindly to this climate, it is always advisable to wait until the twenty-first year at least has been passed.

The Medical history of the British Army in India definitely proves that Typhoid Fever especially attacks our young soldiers. I shall not burden you with figures, but it may be taken as a result of experience that not only is the percentage of those attacked much greater in the younger "Tommys" but also the death rate from Typhoid Fever is much higher. The same is true of most other diseases peculiar to the Tropics.

Is there a right and is there a wrong time at which to arrive in Siam?

Yes, there assuredly is, as you will see at a glance from Plate II. which I have plotted of the Mean Sickness Rate for Bangkok. You will see here the mean rate of admissions of sick people into the General Hospitals of Bangkok for 6 years, the figures having been kindly supplied by His Royal Highness Krom Mun Wivid Wara Preeja, Director General of Hospitals, similar figures from the Police Hospital under my own care during the past six years, and the patients seen by me, month by month, during seven years of private practice.

The total number of cases from which I have struck a mean, amounts to 30,752 an aggregate which is large enough to give a fairly true idea of the sick or Morbidity Rate for this city. Such data are more valuable than the death rate as an index of the health of any town; besides, the true death of Bangkok is at present impossible to obtain. I am glad to say, however, that, within a very short time, an Act for the Registration of Deaths will be in force

in Bangkok. It will be invaluable to me as Medical Officer of Health as it will enable me to keep my finger, as it were, on the pulse of the city under my care. To return to the matter in hand, however, you will note from the chart that April is the unhealthiest month of the year as well as the hottest, and that February is the healthiest. If you will compare this chart with that of the temperature and the rainfall, you will see that the line of sickness closely corresponds with the range of highest mean temperature and the period of the rains. If possible, then, don't time your arrival during any of these hot, wet and most unhealthy months. Such a time of the year is hard enough upon well tried residents but it is still harder upon young and full blooded new arrivals. Not only is it very hot during March and April, but the sanitary conditions of Bangkok are then at their worst. The level of the river is at its lowest, Cholera is often epidemic and, so far as my experience goes, Typhoid Fever takes on its severest aspects at this period of the year. The nights, too, are hot and the combination of mosquitoes and sleepless nights soon tend to lower one's vitality and so predispose one to contract disease.

Towards the end of April and during May, the South-west monsoon breaks and, while this transitional period lasts, sickness is common. As I have reported elsewhere, "Fevers" in general are most prevalent during May, June and July, while Typhoid Fever is most prevalent during May and June, when the rains are setting in and again in December when they have ceased. Owing to the sudden changes of temperature incident on the squalls during these months, chills on the liver and digestive organs are frequent and more so in the persons of new arrivals who do not yet thoroughly understand how to guard against such accidents. It is better then not to arrive before the end of August, preferably not until the beginning of October. The mean atmospheric temperature for the latter month is about 82 and the nights already begin to be cool. During November, December and January, there are frequent spells of quite delightful weather, when the minimum may fall as low as 56 F. between five and six a. m. Arriving therefore in October, one gets accustomed to the heat and so undergoes somewhat of an acclimatisation before the hot weather sets in.

Clothing.

Limitation of space will not allow me to say much of clothing. During the day, the clothing should be light and loose fitting, the material being white drill, light thin flannel or one of the light Indian silks. For underwear, perhaps the best material is Indian gauze. It is a good old rule to dress with the sun, *i. e.* to wear light, thin clothing during the day but to change into somewhat warmer clothing at sun-down. For night wear, thin flannel, viyella or a mixture of silk and wool make excellent sleeping suits. The cholera belt should always be worn when asleep in order to protect the abdominal organs from chill. In the Tropics, the liver, especially, is in a continual state of engorgement and it is the general experience of medical men in this climate that chills on the liver, stomach and bowels form a very large percentage of all sicknesses to which Europeans and even natives are liable. Take my advice and don't go in for any of the numerous fancy made-up cholera belts with their complicated ties, buckles and belts. The best and simplest protection is a broad band of flannel cut broad enough to extend from the lower end of the breast bone to just above the hips, and long enough to pass once round the body and overlap on the front of the abdomen. This can be hemmed or not as you please and can easily be kept in position by a couple of safety pins. Such a band adheres to the figure and does not ruck up or get out of place as practically every other kind of belt does, hence there is no danger of the abdomen being exposed to cold while one is asleep.

Food.

This is one thing any-how, in the East, upon which one should never exert false economy. At its best, our beef is not of the same nutritive value as meat killed in Western countries owing to the habit of bleeding the cattle in the slaughter house. The fowls, too, are poor in quality and generally very tough owing to the careless methods of preparation adopted by our Chinese cooks. If these would have the patience to properly pluck a fowl and hang it for a few hours instead of killing, removing the feathers by immersion in boiling water, cooking and serving up within an hour or two after the bird has been picking up seeds in one's garden, one would

appreciate chicken or capon nearly as much as at home. But who can make a Chinese "cookie" change his ways? As well ask a leopard to change his spots.

Being poor in quality and badly cooked, as a rule, one finds that one must make up in quantity for what one loses in quality.

One must try to ring the changes more frequently than is the general rule, in order to give a fillip to one's jaded appetite. Above all things, however, see that everything for the table is of the freshest. There is no more fruitful source of bowel complaints than tainted meat, or fish, in the tropics. Eat no meat or fish which is the least soft and avoid all such things as crab unless the animal can do one march, at least, across the kitchen floor. Fresh salads, unless made of potatoe, cucumber, beet root or the like, are to be guarded against. Owing to the filthy methods of fertilisation employed by the Chinese market gardeners, lettuces and other green salads are harbours of all sorts of disease-bringing germs and many a case of Typhoid Fever has been traced to a tempting green salad even although the vegetables have been most carefully washed. Tinned foods are to be avoided and as a rule are not required in Bangkok where fresh food can be so easily obtained. When tinned foods have to be employed, use only the freshest and at once discard any with the slightest taint. It is a great pity that the law does not enforce the stamping upon each tin the date of canning, for then many old stocks would be destroyed in place of being sold by the keepers of large stores to the smaller traders.

In one's dietary, avoid extremes. Too much butcher's meat is to be deprecated as is also a tendency to Vegetarianism pure and simple. Excess of animal food throws too much work on the liver and kidneys, while a vegetarian diet is not nourishing enough and does not supply sufficient blood-forming matter to make up for the persistent tendency to anaemia from which all Europeans suffer in hot countries. Some few Europeans have, to my knowledge, adopted a Siamese dietary entirely and would seem to thrive upon it. As an experiment, it is interesting but the majority of European residents would, in my opinion, soon find it a mistake.

Drink.

St. Paul's advice to be temperate in all things is most applicable to the question of alcohol in the tropics. Some residents can be total abstainers for years in this climate. I have known a few and very active and healthy specimens of humanity they were. Others, however, find that without a certain amount of alcohol with meals, the appetite lessens, the digestive organs fail to perform their functions in a proper manner, and anaemia and loss of bodily weight take place. This has been specially noticed by me in people who have spent the first year or so in the tropics as total abstainers. During the first six to ten months or so, residence in hot countries sets up a state of functional excitement in the liver and digestive organs in general, and the result is an increase of appetite, an excellent digestion and general feeling of well-being. As a rule, this initial stage of excitement passes gradually into one of abeyance of function and unless great care be taken at this time, liver and stomach troubles set in.

Tonics, attention to diet and gentle exercise may tide over this period of unrest, but it is now that I have often advised my patients to take a little alcohol for their stomach's sake. It is really remarkable the benefit that one has seen to accrue from the consumption of only one small whisky and soda with meals. For any sake, however, don't go to extremes on the excuse that the doctor has ordered you to take alcohol. My own opinion is that the longer one stops in this country, the less can one stand alcohol and the better one is without it.

Of other drinks, hot tea made after the Chinese fashion is one of the best and least dangerous of all beverages in this country. Made as it is with boiling water, all germs of Cholera, Dysentery, etc., are thereby scotched and as the infusion, though weak, is a mild stimulant, it is no wonder that it is such a great favourite in Siam, China and neighbouring countries.

Water—pure and simple—is the best beverage all the world over. In Bangkok, however, one is greatly handicapped by the absence of a pure water supply. Until the Government has either itself taken in hand a Municipal Water Scheme or has placed the

matter in the hands of some private company, it is necessary for all residents in Bangkok to personally superintend their own water supply. This naturally entails the collection of rain water from the roof of our houses and its subsequent storage in tanks, which may be of brick lined with cement or of metal—the usual form being the iron 400 gallon tank. A few simple rules should guide us in this matter. In the first place, no water should be run into tanks until the roof has been washed by several heavy showers of rain. Frequent chemical analysis of rain water drawn from such tanks has proved to me that one or two heavy showers are not enough to cleanse one's roof, but that only after a good few inches of rainfall, can one expect the rain water to be free from gross impurities. Every year, one should see that the water tanks are thoroughly washed out and then flushed with two or three fills of fresh rain water. If you will only watch your coolie during this process of cleansing, you will be astounded at the amount of filth which comes from the bottom of one's tanks. After this annual cleansing, the next operation is to have the interior of the tank coated with a fairly thick layer of cement-wash. This not only lengthens the life of an iron tank by many years but it also does away with the chalybeate flavour which many of one's tanks give to the water and so it vastly improves the flavour of one's cup of tea. Of course, after this cement washing, it is advisable to once more flush one's tanks with pure rain water in order to get rid of the earthy flavour which the cement imparts. With several tanks, however, this can easily be done in rotation, but all should be ready for the final catch of water by the middle of September. It is wise to have one's tanks filled up before the end of September.

Even after all necessary precautions have been taken with regard to manner and time of collection and condition of tanks it is well to filter the water before use. The best form of filter is the Pasteur (Chamberland) system of which the filtering medium consists of candles made of compressed infusorial earth through which even the Typhoid germ fails to grow within a reasonable time. Such a filter is sufficient in itself to eliminate all noxious germs provided it be taken to pieces once a week and all the parts be boiled for half an hour.

Extra careful people boil the water as well. If this be done, boil the water *after* not *before* filtration. The loss of aeration due to boiling can be got over by shaking up the water, in a bottle, for a few minutes. A word may be said about Aerated waters which are so largely consumed in the East. I have no desire to give any special firm of manufacturers an advertisement on the cheap; all I would say is, buy the best and purest in the market and don't think that because water has been bottled and aerated under pressure, noxious germs have been destroyed.

Exercise.

One of the biggest fetishes to which the Britisher especially, bows down in the East is *Exercise*. I am not referring to the custom of having a round of golf or a set or two of tennis of an afternoon, provided one takes care to avoid chill by changing one's clothing before cooling down. Taken in moderation, such exercise is an excellent method of stirring up the liver. The "*muddied oafs*" to whom I would refer are the men who tell you that they would die without undergoing a couple of hours violent exercise every afternoon and an hour at dumb-bells, Indian clubs or the like before starting work in the morning.

They never seem to be happy unless they are in a state of profuse perspiration and absolute fatigue.

My professional experience of such athletic maniacs is that they are more frequently in the doctor's hands than even the men who take no physical exercise whatever, that the proportion of them who have to be sent home on sick leave is large, and that the end of many has been the local cemetery. It would seem that they use up all their spare energy in "*recreation*" as they call it and have nothing to fall back upon when they do happen to fall sick. If one would only remember that one is living in a country not suited to Europeans, that a hard day's work is more trying here than at home, and that, to be beneficial, exercise should mean nothing more than change of routine, open air and enough movement to produce free perspiration without going the length of fatigue. To go to the extreme of fatigue is to court sickness. Personally, I consider that after a good hard day's work, much of it spent in the open air, the best thing is to take it easy in the cool of the evening

although an hour's gentle exercise either in riding, golf, or tennis, does certainly make for health with the majority of Europeans in the Tropics.

Sleep.

Sleep, which is one of the greatest recuperative influences in temperate climates is even of greater value in the Tropics. One requires really a fool's allowance in this climate. Early to bed, and early to rise is a golden rule, for the longer one lives in the Tropics, the more one finds that late nights are a mistake.

Baths.

A word in passing may be said of cold baths. Don't overdo them as I have seen over-indulgence in cold baths bring about heart trouble, nervous prostration and liver complaints. So long as a cold bath is followed by a feeling of exhilaration and a glowing of the skin, continue the custom, but whenever a feeling of chillness or depression succeeds one's cold tub, use hot water instead. Very many old residents find that a hot shower bath is a better stimulant than a cold bath, and throws less strain on the heart and liver.

Leave.

Leave is an important and all absorbing topic of conversation amongst us sojourners in a strange land.

The question has often been asked me how long one should spend in Bangkok before one's first spell of long leave. This naturally depends upon a number of factors such as the general condition of health, the possibility of being spared from one's duties and, of course, the state of one's purse. Taking it as a general rule, however, I would say that, for a woman, three years and, for a man, five years is a long enough period for a first spell, and that the period of leave should in either case allow of no less than six months being actually spent in a temperate climate. This practically entails nine months leave from duty so as to allow of three months being spent between the home and return journey.

Further periods of work in the tropics should not extend to more than three years with six months leave at the end of such

term. Governments, Commercial Firms and in fact all employers of labour would find that such a system of work and leave would make for the health and efficiency of their staff and therefore for economy in the end. It is no economy to train a man in his work for several years and then to be forced to invalide him home for good at the very time when he is becoming a valuable servant.

The question of short leave, say for a month or two, is one which often crops up in a medical man's experience in Bangkok. Perhaps a man has had a mild attack of Malarial Fever, Typhoid Fever, congestion of the liver or the like. It may not be necessary to send him home as all that may be required is a short sea trip or a few weeks in a cool climate. Given the necessity of having to leave Bangkok for a month or two, what are then the best places to which one can send one's patient?

Siam is still, unfortunately, most grievously deficient in hill stations or other health resorts.

Srimaharacha is practically the only local sanatorium but it is not much of a change. It is wonderful, however, the benefit that may be obtained from a week or two at this pleasant, though quiet, sea-side resort. Bangkok owes a debt of gratitude to His Excellency Chow Phya Surisak for his enterprise in providing the excellent accommodation that is to be found at this place. The great inconvenience is in getting there. Were the long talked of railway pushed through to Srimaharacha, the benefit to the inhabitants of Bangkok would be incalculable as one can go there with advantage at any time of the year. Still better will be Chiengmai and the hills beyond when the present railway has been extended so far.

Further afield, we have Singapore—the return trip to which will often set one upon one's feet again. Then we have Hong-kong from October until the end of March, Japan during the the Spring or Autumn, Java during July, August and September, Penang Hill during the North-East Monsoon, Candy and Nuwara Eliya in Ceylon from December to April, and Ootacamund on the Nilgiri Hills from April till October.

Special diseases to be guarded against.

As I have already said, many of the so-called climatic diseases are preventable. They are due to carelessness or ignorance as to prevention and really, unless, as Carlyle says, most of us are fools, there would be little work for the doctors.

Sunstroke would surely appear to be a frequent complaint in this climate where sun maximum temperatures amount to 140 or 150° F. However, during eight years practice in Bangkok, I have only seen one typical, though mild, case of real sunstroke. The reason for this is that people, as a rule, respect the effect of the sun's rays and wear a good sized solah topee during the day. The majority of us consider that white clothes are a sufficient protection but Dr. Woodruff of the United States Army is of opinion that, with white clothing, black underwear should be worn. The reason for this is that the actinic or chemical rays are believed to be as potent factors as the heat rays, and that black intercepts these. One has no time now to go into the matter but there is a good deal of truth in the belief that a red lining to one's topee is an additional safeguard against sunstroke. Don't forget that the earlier and later portions of the day are even more dangerous than midday; for any kind of topee will protect one's head and neck from the vertical rays about noon, but only a properly made topee will protect the back of the head and neck from the slanting rays of the morning and afternoon sun.

Cholera, Typhoid Fever and Dysentery may be taken together as the principal cause of each is contaminated water.

As I have written elsewhere—"Cholera commences as a rule late in December and attains its maximum in April, thus prevailing during the dry season of the year." Sporadic cases may occur in Bangkok throughout the year, however. In its epidemicity, it closely follows the condition of the river. Given a good rainfall, the level of the river remains comparatively high during the dry season and, therefore, the inhabitants are not deprived of a regular supply of fresh water. After a poor year of rain, the river early becomes brackish and at once Cholera breaks out. Prevention is happily easy. If a European contracts the disease, it is either due to his own or his cook's carelessness. See to your water supply at all times and, while Cholera is about, boil all your drinking water; be sparing with

fruit or saline purgatives, eat no fresh green salads and, above all things, protect all food stuff from flies. I have seen quite a number of cases of Cholera in which the only source of infection was contamination of food by flies. Finally, avoid funk during an epidemic of cholera for it is well known that fear kills a goodly percentage of those who fall in such an epidemic.

Against Typhoid Fever and Dysentery, the same precautions as against Cholera should be applied. In addition, one should be very careful of one's milk supply, to contamination of which I have traced several cases in Bangkok. Some years ago, I made an exhaustive inspection and enquiry into our milk supply here and found the conditions so bad that all dairies were removed to grazing ground supplied by the Siamese Government on the outskirts of the town at Klong Toi. Under improved sanitary conditions and with a purer water supply, one may say that the milk is now less dangerous to health, but, in all cases, it should be boiled or sterilised in one of the patent sterilisers which are on the market, before consumption.

As for Dysentery, while impurities in food and water play an important role in etiology, chills are a frequent exciting cause, therefore do not forget the value of a cholera belt.

Diarrhoea is an extremely common complaint amongst Europeans in Bangkok and is mainly due to chill, and to the ingestion of tainted food. This has been sufficiently dealt with already in speaking of food.

Malaria.

It would no doubt surprise many of you to find that I deal with this last. New-comers talk of Malaria as if it were a foregone conclusion that they would soon contract the disease and yet, if they will only make a few enquiries, they will find that it is the exception rather than the rule for Bangkok residents to suffer from Malarial Fever. My experience, after eight years practice in Bangkok, is that Malarial fever is rarely contracted by residents of this city, that those who do happen to get infected, have generally contracted the disease while on a trip into the interior and that the malaria bearing mosquito, the *Anopheles*, is not easily found even during a search for it. As you all know, the germs of Malarial fever are carried from man

to man by the *Anopheles* Mosquito. Therefore, if you wish to protect yourself against Malaria, keep a good look out that your house or compound does not harbour this dangerous species of mosquito. You may ask how can one differentiate between the harmless *Culex* and the fever-bearing *Anopheles*. A few distinctive points will suffice. When you see a mosquito land on your hand or on any plane surface and instead of decently sitting down on all fours as it were, stand on its head and dig its proboscis into your skin, that's an *Anopheles* and its acquaintance is worthy of further cultivation. Try to find its breeding place in some neighbouring pool or sluggish stream. The eggs are found in loosely connected masses—three or four together—attached to sticks, weeds, etc.

The *Culex* eggs are in little boat shaped masses which float freely on any collection of water about a house and look like little specks of soot. The larvae are the little wriggling fish-like bodies which one sees swimming about so often in one's hand basin. That of the *Anopheles* has no long trunk or breathing tube and so lies with its body parallel to the surface of the water. When disturbed, it glides away, tail first with a kind of skating movement. The *Culex* or non-dangerous larva, has a long breathing tube at his tail which rests on the surface of the water while the body hangs head downwards. When disturbed, they sink rapidly to the bottom of the water.

If you happen to find a breeding spot of *Anopheles* it is quite easy to render it innocuous by flicking a little kerosine oil once a week or so over the surface of the water by means of a rag on the end of a stick. This forms an impervious layer of oil on the surface which prevents the *anopheles* larva from breathing and so kills him. When possible, all collections of water about a house capable of harbouring mosquito larvae should be destroyed or filled up. A further precaution is always to use a mosquito curtain when asleep. In the light of modern experience, any person suffering from Malarial Fever is to be considered as suffering from a contagious disease just as much as if he had small-pox. He is to be prevented from infecting *Anopheles* mosquitoes, if about, by a strict use of the mosquito curtain and cannot be looked upon as free from danger to his neighbours until frequent examination of the blood has demonstrated the absence of the malarial parasite from his system.

The continued taking of Quinine as a preventive is quite unnecessary in Bangkok.

A word to the ladies.

Why is it that, as a rule, you ladies do not seem to stand the climate so well as the men do? My own opinion is that it is because you remain too much at home, are too much in the shade and do not get enough of knocking about in the sun.

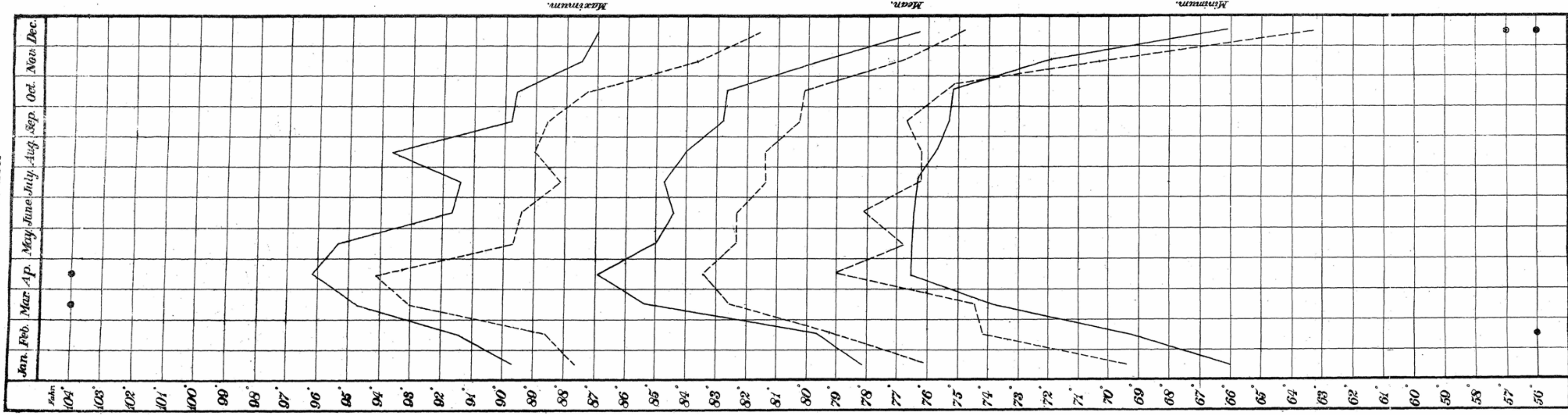
All lower forms of life such as disease germs are hindered in growth and even killed by the powerful chemical and heat rays of the sun. In this, we have one of our greatest helps to sanitation. While destroying lower forms of life, however, plants and trees are nourished and stimulated and take on a healthy tone and colour. You know well how pale a plant becomes if kept in the dark. The same thing occurs with human beings and the less sunshine they have, the paler they become and the less healthy they are. Males in the tropics are most of them out and about a good part of the day and, on the whole, they enjoy good health. Although they put far greater strain upon their livers with slings, cocktails, stengahs and gin and bitters, they still seem to enjoy better health than the weaker vessels. I believe that this would be otherwise were ladies to court the health-giving influence of sun and fresh air more. After early breakfast, a gallop on horseback, a spin on a bicycle, a walk with a camera or an hour or two in one's garden are all healthy and interesting forms of recreation. Don't forget, however, to wear a solar topee. Many ladies think that an ordinary European hat is sufficient and find to their cost that headaches, sun fever and even sunstroke are the cost to pay. After a bath and breakfast, there is the ordinary house work, correspondence and sewing to do, and when all is done conscientiously, it is wonderful how the day passes and how well one may remain even in such a maligned place as Bangkok. It is advisable not to omit an hour's sleep after tiffin. Even if one cannot sleep, it is better for ladies to lie down and rest in bed every afternoon for an hour or so during the period of greatest heat of the day. They are then better able for the afternoon's round of calls, tennis or golf. Beware, ladies, of too many late nights. They are killing to males and much more so to you.

MAIN CLIMATIC DATA FOR BANGKOK.

Month,	Mean Temperature.		Mean Maximum Temperature.		Mean Minimum Temperature.		Mean Daily Range.		Rainfall in inches.		Number of rainy days.	
	*C.	*H.	C.	H.	C.	H.	H.	C.	H.	C.	H.	
January ...	76.1	78.1	87.7	89.7	69.4	66	24.6	0.09	.05	2	0.7	
February ...	79.1	79.6	88.6	91.4	74.1	69.1	22.4	0.56	.175	7	1.5	
March ...	82.5	85.3	93.	94.7	74.5	73.8	19.3	0.83	1.23	1	1.7	
April ...	83.4	86.9	94.1	96.2	79.0	76.5	19.4	2.42	2.67	10	4.7	
May ...	82.3	85.0	89.7	95.3	76.8	76.5	18.1	10.54	9.56	20	14.	
June ...	82.3	84.4	89.4	91.7	78.1	76.5	15.	7.72	5.617	16	15.7	
July ...	81.4	84.7	88.1	91.4	76.2	76.3	15.4	8.02	4.165	26	13.7	
August ...	81.4	84.0	89.0	93.6	76.2	75.7	15.2	5.65	5.95	17	16.2	
September	80.3	82.8	88.6	89.8	76.7	75.3	14.2	11.30	13.9	22	21.7	
October ...	80.1	82.7	87.3	89.6	75.1	75.2	14.8	7.46	8.17	14	18.	
November...	76.8	79.8	83.7	87.5	70.3	71.9	16.4	2.36	2.1	6	5.2	
December ...	74.8	76.3	81.6	87.	63.3	66.1	20.8	0.09	0.58	2	2.	
Year ...	80.1	81.6	88.4	91.49	74.1	73.2	17.9	67.04	54.16	143	115.1	

* C=Dr. Campbell's Data, * H=Dr. H. Campbell Highet's Data.

MEAN MONTHLY TEMPERATURE IN BANGKOK



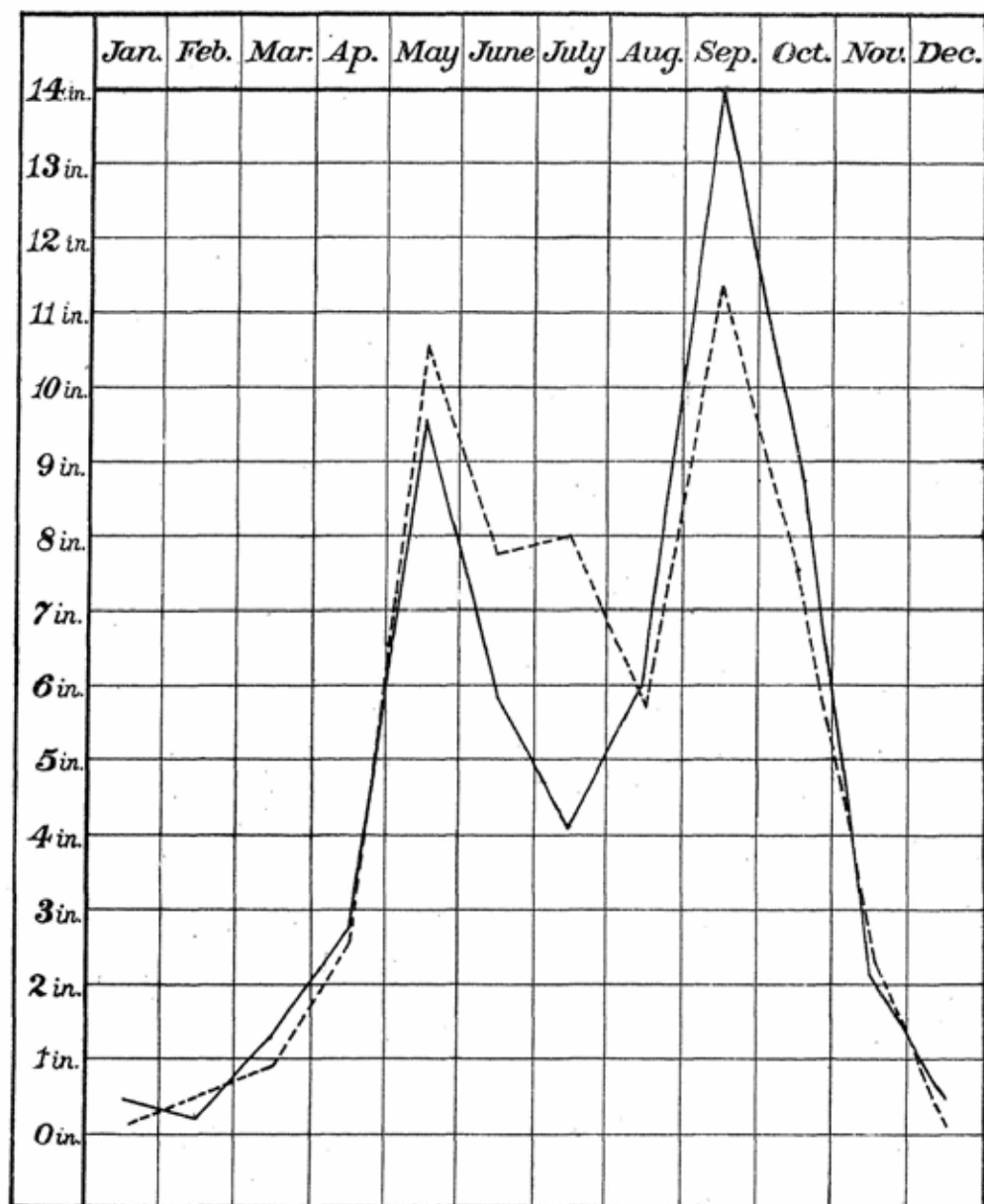
N.B. Dotted lines give Dr Campbell's figures for 10 years.

Firm " " Dr Highet's " " " " " "

● - Absolute Maxima & Minima recorded.

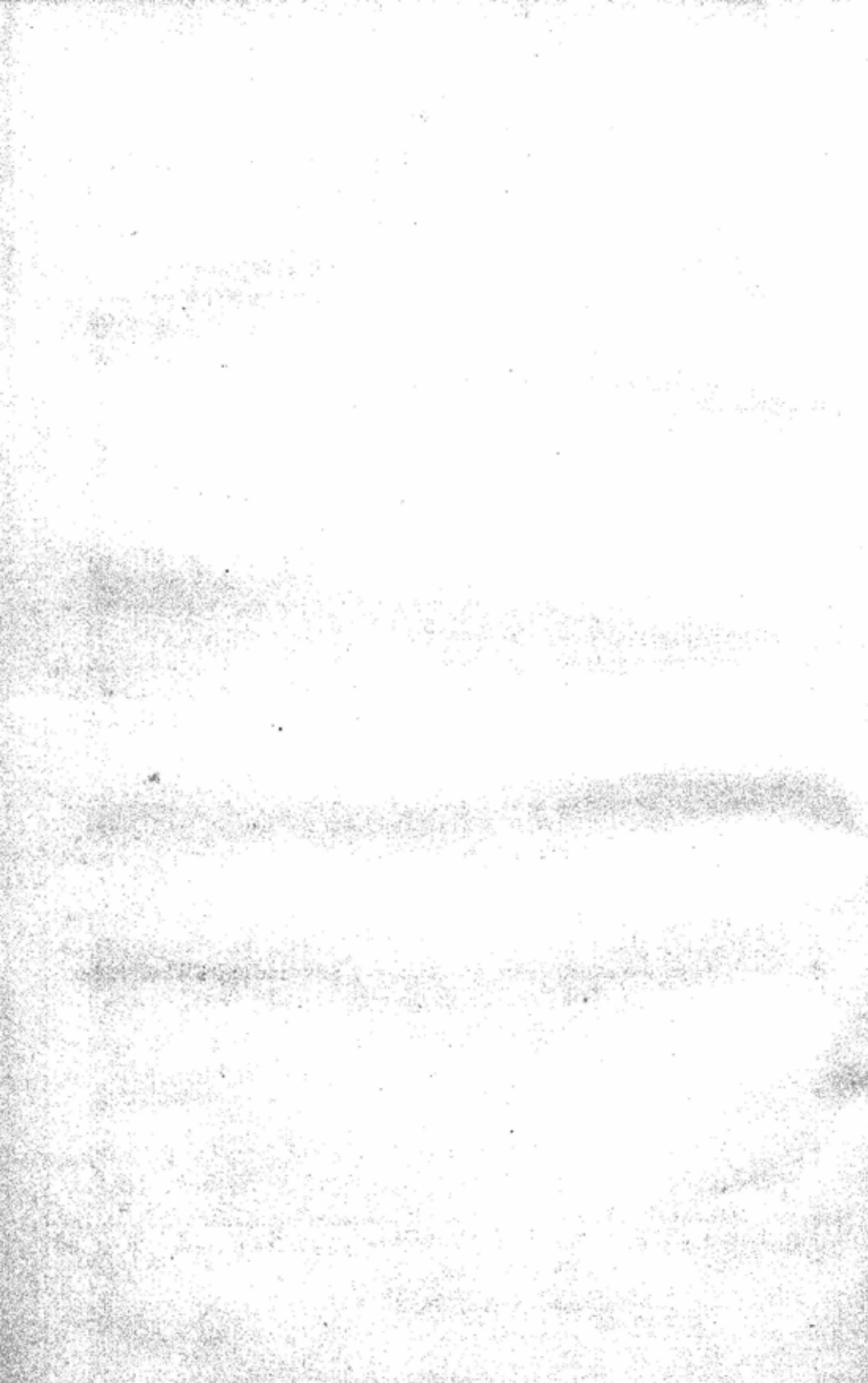
(Dr H Campbell Highet's paper on Climate & Health in Bangkok.)

MEAN MONTHLY RAINFALL IN BANGKOK



N.B. Dotted lines give Dr. Campbell's figures for 10 Years
 Firm " " Dr. Highet's " " 4 "

(Dr. H. Campbell Highet's paper on Climate & Health in Bangkok.)



ORDINARY GENERAL MEETING, 6TH FEBRUARY, 1906.

DISCUSSION ON DR. HIGHET'S PAPER.

The President, Dr. O. Frankfurter, was in the chair, and the business before the meeting was a paper on Climate and Health in Bangkok, by Mr. H. Campbell Highet, C. M., M. D., D. P. H., Fellow of the Royal Institute of Public Health, and Principal Medical Officer, Ministry of Local Government. There was a much larger attendance than usual.

In opening the proceedings the President said there was no need for many words in introducing Dr. Highet. The subject he had chosen was one which necessarily interested us all, for were we not, and had we not been, all at one time or other the corpus vile on which experiments had been made. We knew very well that Bangkok could not exactly be described as a health resort, but on the other hand we did not know exactly what Bangkok is like in these respects. If we would rely on the books of the passing tourist, whose least sympathetic variety is, as Sir Ernest Satow has it, the nineteenth century globe-trotter, we should be strangely out of reckoning. We should have the globe-trotter's idiosyncracies, as affected by an experience of sometimes a couple of days, but we should not have facts. Dr. Highet would give them exact data. As far as meteorological observations were concerned Dr. Highet could rely on what some of his predecessors had done—such as Dr. Campbell, Dr. Bradley and others. With regard to health, Dr. Highet would give them the data which he had collated during an experience of some eight years in the East, and, the President added, he believed he was right in saying it would be the first definite statement about health in Siam, as whatever of value had been said before had appeared in medical and other scientific journals, not generally accessible to the layman.

Dr. Highet then read his paper, and at its conclusion the President suggested that the discussion might fitly be begun by the medical men present.

Dr. T. Heyward Hays said Dr. Highet had covered such an extensive field that he could not follow him over it all. But Dr. Highet had made one or two points with which he (Dr. Hays) entirely disagreed. He had spoken of Dr. Campbell being here 20 years ago; it was really 28 or 30

years ago. Then as to typhoid fever—the word never occurred in Bangkok until the Sanitary Department was established (laughter). He appealed to all of them who knew Dr. Gowan and Dr. Deuntzer; typhoid fever was never known here until the Sanitary Department was started. Personally he had not believed in it, but at a recent meeting of the Medical Association Dr. Highet showed them the bacillus, and now he was convinced. But typhoid fever was the result of the insanitary or half insanitary condition of Bangkok, and it would be wiped out by proper sanitary conditions. Next there was that question of drink. He had never himself tasted alcohol in his life, until he arrived in Bangkok, and he found in 20 years' experience that the men and the women who died of cholera or dysentery were teetotallers. A moderate amount of alcohol with meals would keep them straight. He did not agree with Dr. Highet's idea of cholera belts. He should say, no cholera belts! Dr. Highet gave them his eight years' experience; but he (Dr. Hays) gave them 20 years' experience. The men and the women who wear cholera belts take them off suddenly; and that constituted the danger. If anyone did wear a cholera belt he should wear it day and night, should in fact never be without it. But the true advice was, don't wear a cholera belt. He had himself been here 20 years, and he had never had a cholera belt—he would rather die of cholera (laughter). Now, about climate. Considering the insanitary conditions, and considering the life that we lead, there is no city in the East more healthy than Bangkok. But when a man was coming up from Singapore, he was generally told to make his will. Why was it? It was perhaps because General Feilding died here of cholera. He died here of cholera because he drank tea prepared with bad water. They should never drink such tea, they should never drink tea made with filthy klong water warmed up a little. They should also beware of soda made with klong water; that was also very fatal. Dr. Hays went on to give advice about the filling of water tanks, and with regard to mosquitoes said, Cover up your water jars; never have any water in or around your home without keeping it covered; fill up all small pools.

Dr. C. Beyer said:—"The question how the climate affects the European, cannot be answered perfectly by enumerating all the different tropical and other diseases of Bangkok. Even supposing that the Sanitary Department were to be so successful as to stamp out, or very greatly reduce Malaria, Typhoid fever, Cholera, Plague, and Dysentery, Bangkok, although it would be much more healthy, would nevertheless

not be a town where a European could reside for a life time.

"Bangkok is situated in the Tropics, where—the experience of centuries shows us—full acclimatisation is impossible for the Caucasian race, which has nowhere been able to populate a tropical climate, despite the supremacy of political or commercial influences. After a few years the European has to return home for the restoration of his health, and when, as rarely happens, a family does settle in the tropics, propagation after the third generation as a rule does not happen.

"Contemplating this question of the influence that the climate in Bangkok has upon the European, we have to ask further what is meant by acclimatisation in a tropical climate and whether in any respect Bangkok possesses any advantage over other tropical cities or not.

"Regarding acclimatisation—it is evident that the body must adapt itself to the greater heat and humidity of the air of the tropical climate. The human body must and can keep its own temperature, the same at the poles as at the equator by adapting its own warmth to that of its surroundings.

"Now the human body gets its warmth mainly by burning its food, and in a much less degree by the contraction of its muscles. This production of warmth is enormous being on the average 2500 calories in 24 hours. (1 Calorie is equal to that quantity of warmth which is necessary to warm 1 litre of water 0 degree C. to 1 degree Celsius). The old explanation of acclimatisation was that the body, after a long sojourn in the tropics produces less warmth, and adapts itself in this way to the temperature of its surroundings; but exact examinations—especially in Batavia—prove that the chemical production of warmth *i.e.* the number of calories produced is exactly the same here as in Europe.

"That being so, necessarily the body must throw off more warmth here than in Europe. As I said before, the body must bring its own temperature into harmony with its surroundings, otherwise the body with its continual production of warmth would resemble very much an overfed oven; *i. e.* would exceed its own normal temperature. This escape of its surplus warmth is effected by ex-spuration, and evaporation on the skin. We know that the air of ex-spuration is warm, and that we throw off by ex-spuration, which—be it noted—is slightly accelerated

in the tropics, about 20°/o, and by the skin about 70°/o of the whole surplus warmth. The skin throws off the warmth by radiation, but here much more by evaporation, the body producing perspiration, the evaporation of which produces cold. This evaporation is of course much more easy in dry heat than in an atmosphere nearly saturated with moisture. In Bangkok the relative humidity, which in Europe is from 62 - 70%, is increased very highly, being on the average 85—90°/o. That explains the well known fact that hard work which requires a greater effort of the body, and therefore much perspiration, cannot be done by a European here, while we frequently observe that the native may do it with impunity. It further explains why the European is well fitted for hard work in a country with dry heat; *e. g.* in the Sahara, where long marches can be made by European troops.

“ Besides the difficulty of regulating our own temperature to the great heat and humidity of Bangkok, the situation of the place close to the sea must also be taken into consideration. It has a tropical sea climate, which means an atmosphere of increased humidity compared with that of towns situated further inland. Against this must be set the sea-breezes which reach us and assist in the evaporation of perspiration: but, on the other hand, it must be remembered that the light tropical breezes do not assist in this process to the same extent as the more violent winds of Europe. Proximity to the sea therefore is of doubtful advantage.

“ Again Bangkok is far removed from any hills. In the tropics temperature rapidly decreases as altitude increases, and in the British and Dutch Indies we find numerous hill stations with sanatoria; but Bangkok possesses nothing of that kind, the hills being far away and as yet having neither sufficient railway communication nor any sanatoria.

“ The average difference in temperature between the hottest and coldest month is only about 4° Cels., while we are accustomed to much greater variations in Europe. We often see therefore, as an effect of the climate upon Europeans, palpitations of the overworked heart, loss of energy, general debility and weakness; but that everybody gets anæmic here is not true, a careful examination of the blood showing that the number of the corpuscles are the same as in Europe. Anaemia, from climate does not exist.

"That most Europeans lead an unreasonable life, keep late hours, consume too much beer or whisky soda and much too much meat, is not due to the climate. More than two stingahs an evening as a rule should not be taken: spirits are a stimulant for the heart, but a healthy man is just as well without them.

"Cholera, Typhoid fever and Dysentery are every year rife amongst the Europeans. Add to this the climatic difficulties as shown above, and we may come to the conclusion that Bangkok is relatively an unhealthy town, for the European, certainly a town which when compared with other tropical cities with greater differences in their daily and monthly temperatures, less relative humidity and hill stations close by, is at a great disadvantage."

Dr. McFarland emphasized what had been said by Dr. Highet with regard to the care of the teeth. People should give every attention to preserving their teeth as long as possible and thereby strengthen the body for the work it has to do in standing against the climate.

Dr. Hays intervened to urge the value of an afternoon sleep, a point he had forgotten to touch on.

Dr. Mackenzie was also asked to contribute to the discussion. He agreed with Dr. Hays as regards the cholera belt. He did not think it of any service. In South Africa he had had ample opportunities of watching typhoid fever, and could say that till we got a proper water supply here there was no chance of stamping it out. It was a rather interesting fact, however, that Zanzibar has no typhoid fever. It was a very similar climate, and sanitation was of the most primitive description. Till we got a water supply we should also still have cholera. Malaria was a preventible disease, and too few precautions were taken by residents here with regard to mosquitoes. If one took a little personal trouble, one could do a great deal to eradicate mosquitoes, by the use of kerosine. Inoculation against typhoid fever had not proved much of a success as a preventive, but it certainly made an attack much lighter.

Mr. Leonowens thoroughly approved of a nap in the afternoon. A cholera belt was a thing he had never worn, and he should think it a bit of a risk. With a reasonable amount of care, and not too much drink and smokes, he thought it was a climate one could get along in.

The Rev. J. Carrington disagreed with the lecturer in saying that the first term out here before going on leave could be longer than the terms afterwards. He thought the first term should be the shortest, and then one could keep well longer after that. Stress had been laid on the importance of a sun topee, but from his own experience he preferred a felt hat and an umbrella. In 1869, when he came here, they were told that they could not tour in the rainy season, but as a matter of fact they could tour at any time of the year in this country. His advice briefly was: Take good care of yourselves; keep your feet dry; drink all the water you want to drink—it is the most natural means of quenching your thirst.

Colonel Gerini, from his experience, entirely agreed with what Dr. Highet had said about bathing. Then during the hot season, from March to September or October, he had carefully avoided fish and milk. Any serious illness he had had, could be traced to prolonged travel in the jungle.

In replying on the discussion Dr. Highet thanked the speakers for the kindly way they had taken the paper. He agreed that a nap in the afternoon is an excellent thing, also that the European did not become acclimatised, and he touched on various other points raised. His colleagues seemed to think inoculation was not of much value against typhoid fever, but if they got any method that prevents infection for three or four months that method was worthy of consideration. Dr. Beyer remarked that the results had not been very good in German South-west Africa, but as a result of the study of this question the surgeons of the German Army had given inoculation their support.

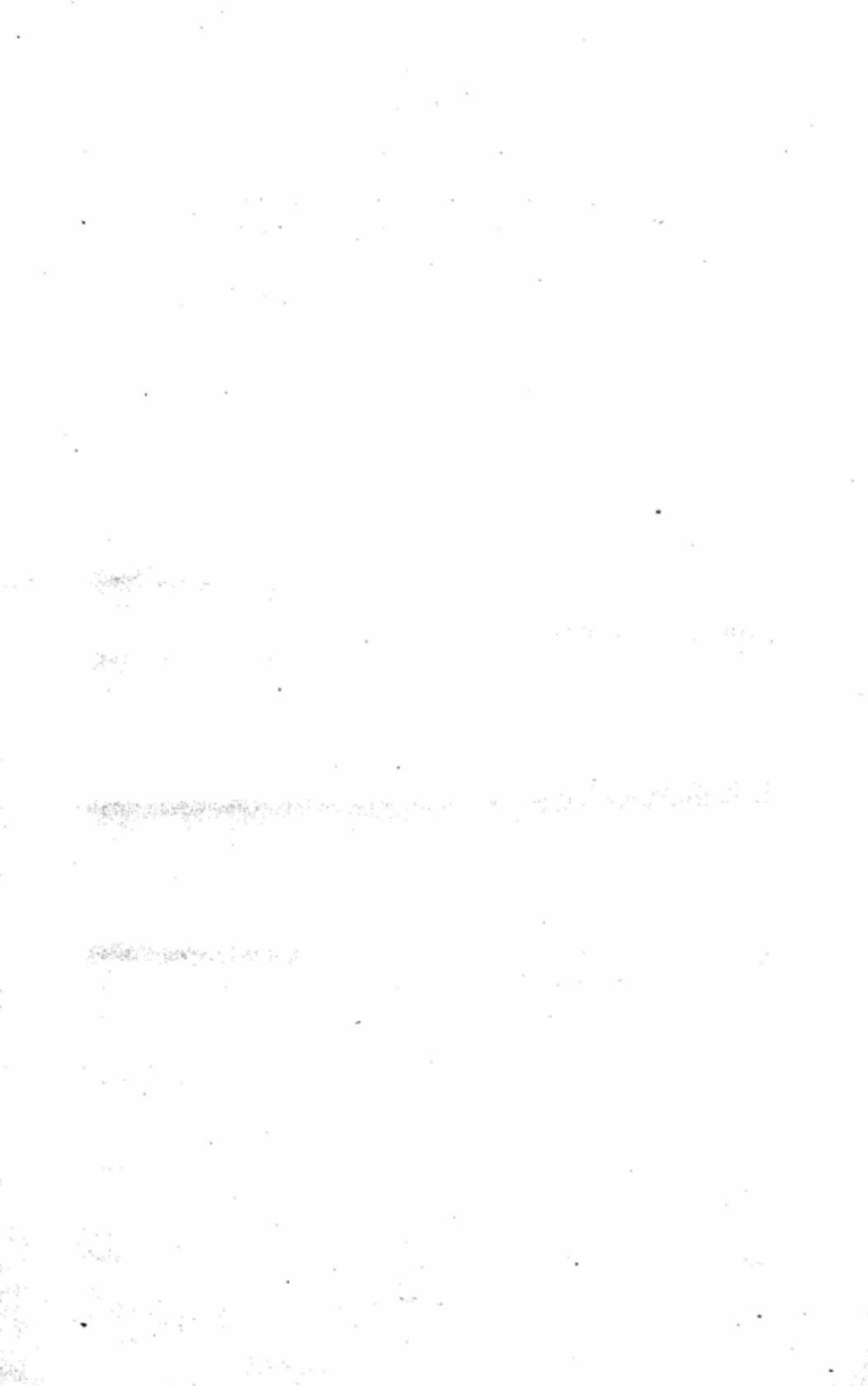
Dr. Hays said it was doubtful if Colonel Gerini would be present at another general meeting, and he therefore proposed that a vote of thanks should be passed to mark their high appreciation of Colonel Gerini's services to the Siam Society, and that this should be recorded on the minutes.

The President said that to show its appreciation of his services the Society had already appointed Colonel Gerini an honorary member, the highest honour in its power to bestow. But he agreed with every word Dr. Hays had said, and would be very glad to put once more on record their appreciation of the Colonel's services. They wished him a happy life at home in Italy, and hoped at the same time he would not forget the Siam Society, whose great support he had certainly been.

The motion was passed by all standing.

On the motion of the President, seconded by Mr. Florio, a cordial vote of thanks was accorded to Dr. Highet for his very able and interesting paper.





Montone Puket (Siam)

Malay Peninsula.

BY REV. JOHN CARRINGTON, B. A., M. A.

One of the most beautiful and enchanting spots in the world, and certainly in Siam, lies on the the upper west coast of the Malay Peninsula, washed by the waters of the Bay of Bengal. This piece of land lies between 10° north latitude and about 7° south. It may be said to describe an arc of a circle, one terminus ending in the Salween, Lower Burma, and the other in Kedda, or Saiburee. This includes the adjoining islands which at one time may have formed a part of the mainland. In proof of this there is 1. the structure of the islands, 2. the fauna, 3. the flora. This, too, is the opinion of Wallace, who has discussed this subject at some length.

It does not lie within the purpose of this paper to discuss the ancient history of this Montone, but to write of it more as it is at the present time, and as observed by the writer during five tours through this region.

This is a portion of Siam, Malay Peninsula, the "Tanah Malayu," or Malay Land. At Kra, กฺรา , or Kraburee it is about 45 miles wide, and at a line through Junkceylon and Nakon it is about 200 miles in width.

It will be in place here to name the provinces into which Puket Montone is divided. We begin with the most northerly one and name them on down in their order of location :

1. Ranong— ระนอง —formerly Ranong and Kra. Ranong is said to signify a place of much water ; and indeed this is true in the rainy season.

2. Takuapa— ตะกั่วป่า —the place, or wilderness, of lead ; named thus, perhaps, because the first tin discovered there was supposed to be lead.

3. Pangnga—พังงา—formerly Takuathoong (lead field) and Pangnga. พังงา undoubtedly means, in this connection, very beautiful, as it will be seen that this is a province of great beauty—and not Elephant's tusk, as some Siamese think.

4. Puket, or Thalang, or Junkceylon. It may be the word *puket* is the Malay word *bukit* for hill or mountain. I am not satisfied about this definition. This is a large island separated from the mainland by a very narrow passage of water, and lies south of east of Pangnga. The main town is Tongka—thoongkha—ทุ่งคา, field of grass, or grass field.

5. Krabee—very incorrectly called Gerbee. The Siamese word is กระบี่ meaning a sword. This is a good Siamese word for that weapon, a lower word being *dap*, ดาบ, the high word being พระแสง.

6. Trang, formerly Trang and some other small states. Trang ตรัง is said to mean “adhere” or “joined to.” The application I am at a loss to discover for the present. It may be that this territory was acquired by the Siamese later than that adjoining it in the North or East, and so was called “joined,” that is joined to what they already possessed. This is merely conjecture on my part, and I do not insist.

I have here named these provinces as they will be constantly referred to in what is to follow.

Mountains and Hills.

There runs the whole length of the peninsula a ridge of mountains and hills, irregular in height and width; and really a continuation downwards of the Salween or Tenassarim range. In the Puket Montone these mountains do not reach any considerable height, but are much higher in the Southern part of the peninsula. Indeed one is now said to be 10,000 feet high. It is in what is called the Tahan chain. In my trip across the peninsula after leaving the Krabee Mountain I hardly knew that I was among mountains all the way from Krabee Noi to the Bandon river. This ridge of mountains may be said to be the natural reservoir which with its innumerable springs and brooks supplies the many rivers running to

the coast. Then too they furnish the earth, which in rainy seasons is constantly carried down the streams, to fertilize the plains in the overflow season, and to make new land on the borders of the sea; but this last can never be carried on to any great extent as the peninsula is so narrow and the mountains so comparatively low. Delightfully cool and clear water flows from these declivities to refresh the traveller, the inhabitants and animal life—nature's true beverage. At Takuapa is a delightful spring of water flowing out of the mountain side. This leads us to the next topic.

The River Systems.

The rivers are numerous, but of no great length. The most northerly one is Pak Chan, ปากจั่น, incorrectly named Pakshan. This stream has its source above Kra, and winding down in a southern direction is enlarged greatly at about the place called Ban Nām Chut, and then becomes really an inlet of the sea. Good sized vessels can move up it to an anchorage opposite the Lacon river on the Siamese side, and Malewan on the Burmese side, for this river here separates Siam from Burma. Malewan, มลิวณ, according to Pallegoix, means wild jasmine. The Siamese Mali flower is very sweet.

The next large river is the Takuapa. This stream is very tortuous, and flows mainly from South to North. It is muddy, showing that there is considerable mining going on above. This stream flows through considerable rice country as yet uncultivated, which could be made to produce vastly more than it is now doing. The delta of this river is cut up into many islands, with two main entrances, one north, one south, presenting much beautiful scenery.

The Takuathoong and the Pangnga rivers are unique for rugged mountain scenery. In passing from one to the other of these towns one branch of the river flows through a tunnel under a mountain, through which boats come and go. This cave tunnel is of exceeding beauty, immense stalactites hanging from its ceiling, of many tons weight. The grandeur of this sight is beyond words to describe.

As we cannot delay to mention all these rivers in this Montone we speak of but one more, the Trang. This, too, like the others has its source in the hill country and flows south to the sea. It

winds its way through a large valley of considerable productiveness, which could produce with more extensive cultivation many times the present output of rice. This river is navigable ordinarily by steamer some four hours journey up from the sea.

Puket, or Junkceylon, has really no river worthy of the name. At Tongka the stream hardly in any serviceable way reaches the town.

Climate.

The climate of this region does not differ materially from that of similar latitudes in the Kingdom: and the rainy and dry seasons are about the same.

Flora.

The entire coast is covered with mangrove trees, and in some places these reach several miles inland. These peculiar trees present a unique sight to one journeying up these rivers and along the coast. The mangrove is the rhizophosa. The fruit or rather germ of this tree is like a bulb with a spike attached to it growing on the limbs. This bulb is really in two sections, and contains rather than a pulp the rudimentary stems and leaves. When developed to a certain degree of ripeness it falls from the tree spike down-ward, the spike being driven into the mud of its own weight. The rudimentary roots are in this stem or spike and develop and grow in the mud, and as the tiny stems and leaves grow and swell in the bulb it gives off the upper half and henceforth it is a visible young mangrove tree. These forests present a peculiar appearance with their high bare roots, looking like huge spiders or crabs with trees on their backs. This is a great and almost inexhaustible supply of fire wood, the bark being excellent for tanning leather, and on account of its astringency is sometimes used as a medicine. Then too, there are the mango, mapring (maprang of Bangkok), cocoanut, pradoo tree, vines of all kinds, jackfruit, etc. In crossing from Krabee to the Bandon river I passed through two large forests in which are many large tall trees; and there were wild grape vines all the way, some in bloom and some bearing fruit not yet ripe, so that at times the fragrance was like that of a home vineyard at blossom time. The grapes I first discovered in Krabee province. They are sometimes used by the people in curries. I also discovered

the old fashioned home cat-mint or cat-nip used as a medicine. In various places are growing what may be styled semi-tree and semi-vine. Its peculiarity is that at the base of their flowers grow leaves almost purely white, while all the other leaves are green. There too is a tree which bears a strange fruit—strange in that its seed, as large as a lima bean, grows on its outside at the end opposite its stem. This is called “mamuang himaphan,”

มะม่วง หิมะพาน, i. e. the mango of the forest. This fruit is exceedingly juicy and instead of containing real pulp, it contains a mass of fiber. It is not unpleasant to the taste and it is consumed in large quantities by the people. A strange tradition is related of it, saying that one day a priest walking along stepped on one of these fruits and mashed the seed out of it, and though before that incident the seed always grew within the fruit, ever after it has grown on the outside. Trang seems to be the only province in which enough, or nearly so, of rice is grown for its home consumption. All the other provinces import rice in considerable quantities. This may be accounted for largely on the ground that this is a mining region, and some provinces being given much to cattle and buffalo raising; for indeed many of the valleys are little more than touched agriculturally. Two kinds of rice are grown, the hill and the plain. The hill rice is grown by digging small holes on the hill sides, and a few grains put in each. It is a pleasure to walk through the pepper gardens of Trang. These are abundant. The pepper is a vine and not a tree, and is grown on stakes or certain kinds of soft wood trees, the garden looking much like a *plu* garden. The only difference between black pepper and white is that the dark hull is taken off the former and we have the latter. Trang pepper is noted for its fine quality.

Fauna.

Wild elephant, rhinoceros, tiger, buffalo, cattle, monkeys of many kinds, all sorts of reptiles, and insects innumerable, abound. As the mountains and forests on the Puket side cannot differ from those on the Gulf of Siam there must be many very beautiful birds. On my way down the Bandon river the Chinese had two bundles of these beautiful feathers, and at Bandon town, the day after rain, many bundles of exceedingly beautiful feathers were out

in the sun to be dried. Then on this side, too, there must be the same. The peculiar bird called hornbill abounds in this region, and his flesh is a good article of food. There are wild ducks and pigeons. In some parts just before sunset a peculiar metallic ring is heard among the trees. This is believed to be the sound of a peculiar beetle. The "cheene" or Gibbon or "oungka," both white and black ones, abound in large numbers, screaming all day long in the hills and on the mountains. These are of the hilobate species, a kind of Ape noted for its agility in climbing and jumping. Some of the people say that once upon a time Mrs. Cheene was the cause of her husband being killed in combat, and these screams heard, are her pathetic calls for him to return to her.

Geology.

This we can but touch upon. Granite, sandstone, and limestone abound. Lime is burned at Pangnga and shipped in native crafts to Tongka. Of silver and gold we can say nothing. Of coal—well, some has been seen, and was, I believe, considered quite inferior. But this Montone can boast of tin, both as to quality and quantity. Puket, Takuapa and Ranong lead in this metal.

Industries.

The first is tin. So far, the mining has been surface work, *i. e.* from a few feet to, say, twenty deep. The soil is washed from the ore in sluice boxes. The smelting is done in small furnaces, about three feet in diameter and three or four feet in height, the fuel mixed with the ore being charcoal, which is burned in pits accessible to the smelting places. Usually hand-bellows are used for accelerating and intensifying the fires. At Ranong, however, an engine is used which can serve some six furnaces. At this place I saw also a system of pounders raised by pegs on a windlass moved by water power, and left to fall of their own weight, for the purpose of pulverizing the old slag to be resmelted to save the residue of tin. The ore is brought down to some of the towns to be smelted, in various ways—on elephants, carried, etc. Much tin must be lost in these primitive styles of working. Of this metal there must be still vast quantities in these plains, hills and perhaps mountains. At Tongka steam is used for pumping up water for mining purposes.

Then there are agricultural pursuits. I have seen fine rice growing in these provinces. The hill rice is of poor quality. The territory is capable of producing more than is needed for home consumption. Cattle raising is on a good scale in sections. It was said in Takuapa that there were as many buffaloes in that province, as people. The Chinese raise a great many pigs, and at one town in Krabee I noticed there drying a considerable amount of copra (cocoanut). In all the land I saw but one brick-yard—at Ranong town. There does not seem to be much weaving done—what little of this is done, is, I suppose, for home use only. There is a certain amount of fishing, but perhaps only for home supply. As the yang tree abounds, no doubt something is done in the line of yang oil, and torches. To a certain extent the markets are supplied with fresh vegetables, but not in great abundance. Plenty of fine sweet potatoes are at times in Tongka for sale, and good fish in Tongka market. Quite pretty mats are made at Pangnga, and in Tongka usually pouches, and money bags woven out of reeds, are for sale. It is said that the finest of these, and some of them are very fine, but difficult to obtain, are made on Long Island. This island belongs to the province of Pangnga. Their boats, and the equipments thereof, are very rude and poor.

Commerce—Imports and Exports.

I have no official figures referring to imports: but I have observed a great variety of things imported into these provinces, some of which I will name: Rice, piece goods, oil, crockery ware in all lines, flour, spirits, lamps, corrugated iron, hardware in the line of hammers, hatchets, locks hinges, screws, nails, wire, etc., all sorts of tin utensils, soaps, biscuits and other tinned provisions, teas, all sorts of sewing materials and accompaniments, as threads, cottons, needles, etc. In a word there are in all these provincial towns shops well stocked with such goods in great variety.

Exports—Pepper, tin, buffaloes, cattle, pigs, torches, wood, fowls, and many other articles in a smaller way.

The means of import and export, are junks, which are always seen coming or going, or lying at anchor in the various rivers.

Then there are regular steamers calling in at the anchorages of all these main rivers, carrying passengers and cargoes in and out—and the variety of articles surpasses in number those we have enumerated, by far.

We have to thank Mr. Giles for the following figures showing some of the exports from this Montone.

Tin.

Muang Province	Wt. tin-ore		Wt. of Tin	
	Piculs.	Catties.	Piculs.	Catties.
Puket	7488	07	32,355	39
Trang	8	01	645	52
Ranong			5,130	30
Takuapa			10,444	80
Pangnga			5,475	29

The above figures are for the year 123, and show Puket as first, Pangnga 2nd and Ranong 3rd. Mr. Giles has kindly furnished me also with the following table of exports for the same year, which we are very glad to get as it is fresh information.

Statement showing some articles exported from Puket—year 123.

No.	Muang.	Pepper.			Buffaloes.	Bullocks.	Pigs.	Fowls.
		Weight.		Value.				
		Haps	Catties	\$				
1	Puket	—	—	—	—	—	895	4674
2	Trang	9662	19	58002	1336	246	21883	56296
3	Krabi	475	—	2852	27	—	43700	3973
4	Pangnga	40	52	1215	—	—	—	—
5	Takuapa	—	—	—	—	1	—	—
		10178	11	62069	1363	247	66478	64943

None of these articles exported from Muang Ranong.

The Provincial towns.

It is added information to refer, at least, to these. Ranong town is divided into four sections and contains a population of about 1,200 souls, mostly Siamese and Chinese. Many of the buildings are tolerably good, many are frail. There is a good court-house building, and the jail is a good brick building, which with its surroundings is kept in most excellent condition. The buildings used for governmental purposes are all that is desirable. There is a school here well conducted. Many good roads are here kept up.

Takuapa is largely of brick buildings, in fair condition, with much need of more lime as white-wash, and more cleanliness. Here are some good roads, and good well water, with a fine spring flowing from the side of a mountain near by.

Puket has fine government buildings. The roads and city are being improved a good deal. The city has a good market, and the main street is lined on both sides with good substantial brick buildings. There has been here much advance in improvements, for which his Excellency the High Commissioner deserves much credit. Population about 10,000.

Pangnga has good roads, is a brick town and is well kept.

Krabee is well kept, but its buildings are of a frail nature.

Trang town is a comparatively new city, it having been moved from the old site. It has many excellent roads, fine public buildings, a good school-house and clean quarters for prisoners. The High Commissioner is entitled to much credit for improvements and good order here. It should be said also that the steam-boat landing is well kept. Indeed throughout this province are many miles of fine roads.

I should like to add here that in visiting all these and other places in this Montone our treatment and entertainment have always been all that could be desired, and frequently more than could be expected.

We now come to speak of the inhabitants of this Montone. According to the *Bangkok Times* of December 11th, 1905, the population of Montone Puket is 178,599. This is the official census for the year. This census makes the number of Malays 34,903 and Chinese 32,408. Now say the various people aside from these named and the Siamese are 10,000, then there are some 101,288 Siamese in the Montone. A total of 178,599. It is far from a necessity in this paper to say much concerning the Siamese, Malays and Chinese; these being so well known to all. We have just a few words concerning the Chow Nams, Sea-gypsies, ^{น้ำ} ^{คน}, or water people, and the Negritos or aborigines of the peninsula. These with a sprinkling of Burmese and Indian traders compose the 10,000.

The Sea-Gypsies are called by the Siamese Chao Nam, water people, and by Kean Orang-laut; laut is Malay for sea. Kean says, "They are no longer the vile people dwelling more on sea than on land, and living by fishing and robbing." There is no doubt that they now dwell much in boats, though they have villages on land, and live by means of fishing, but they may have also other ways of maintenance. I learned that they are a law abiding folk and give next to no trouble. I have seen them in the markets and towns, and have visited them at their homes, and found them friendly and innocent. Kean says, "The Orang-laut have risen considerably in the social scale since the spread of English power and influence through Malay land and North Borneo." I was enquiring of a gentleman from Borneo recently, and he says there are many of the Laut people there. They are "described by De Barros under the name Cellates, or people of the Straits." These opinions and many of their characteristics go to show that these people are from the south, and a fragment, I think, of the Malays.

There is a very pretty and quaint saying concerning these modest, inoffensive people. It is said that when two young people of them fall in love and decide to marry, they commence together to build a boat. Their boats have wooden bottoms and from these the sides are built up with reeds and then dammared and oiled. When the boat is finished and ready for habitation these two lovers commence life together therein, and are henceforth man and wife. May peace and happiness and prosperity go with them.

Negritos.—These are without doubt the aborigines of the land. I have seen some of these people in the province of Trang, and cannot, of course, doubt their existence. They are in the Andaman islands, and I believe in Sumatra and many other islands. As I have seen them, they are modest and quiet. And they looked upon the Siamese and Chinese and myself with something of wonderment, not fear. They were not averse to receiving a few atts. Their errand seemed merely to visit the town and market to obtain a few simple things and return to their forest homes. They are said to live mainly by the chase, and in leaf huts. They, as I saw them, are rather short, not large featured, and have genuine African woolly hair. Whether they came to the peninsula from the Andamans, or Sumatra, or other islands, it must be that their place of primary origin is Africa. I have heard it said of them that sometimes when overcrowded by other natives their odor overcomes the Negrito and he faints. This is perhaps because he is so accustomed to open, free air. It is a fair question, why should these people be denied the advantages of education, civilization and Christianization?

The use of the Siamese language by the Siamese themselves of this Montone is very peculiar. They drop whenever they can the initial letter or syllable of a word. For example, ตลาด, market, becomes ตาก; กว่า, more, becomes วา. In Tongkah the vowel ^๔ becomes อี; พงษ์คือ is pronounced พงส์คือ. In Krabee the peculiar letter ง is displaced by ห or ฮ; and ง่าย, easy, becomes ฮาย and งาน, work, becomes ฮาน; ไ, ai, is changed into โอ, oi; so ไบ ไพน becomes โอไบ โพน. Then the tones are all misplaced and really new ones substituted for the true ones. Perhaps these peculiarities have crept in because of the long isolation of this part of Siam from the Bangkok region; then, too, many years ago according to the history of Siam many captive Laos from Chiangmai were consigned to the Malay Peninsula, and indeed the Siamese language peculiarity of this section does not sound unlike the Laos dialect. พรุ่งนี้, to-morrow, becomes ต่อพรุ่ง; and ไม่เข้าใจ, do not understand, becomes ไม่รู้ฟัง, etc., etc. There is no distinct Siamese

literature in this section. The people constantly ask us for the Siamese books that have been published in Bangkok. We find on our tours that our Scriptures and other Christian books are read and understood well by these people. It is a good sign, too, that so many of the women can read. It is a day of good beginnings in this Montone, of schools. In the Montone, there are some 1,000 Buddhist priests; and some 400 novices or nanes. There are of course among the Malays many Mahomedans; and there are some Christians with one Protestant mission located at Puket; and one Roman Catholic mission.

No doubt one good remedy to cure the misuse of the Siamese language in this section, is the full establishment of schools manned with Bangkok men as teachers, or with men selected from the region and educated in Bangkok. Then, too, the pupils should be forbidden the use of any but pure Siamese during school hours.

The Siamese materia medica and the medical practice of the Montone are much as in the region of Bangkok. A doctor, I saw waiting for a steamer, had a fine supply of medicinal wood with him. One might almost wonder whether or not he was carrying fuel or fire-wood. Their medicines are largely decoctions and pills as large as marbles.

This theme should not be dismissed without further notice of the exceeding great beauty of the Montone. Ranong town is surrounded by mountains of much beauty. No matter which way the eye looks it is charmed with settings of grandeur. A road winding its way up toward the tin mines in the mountains beguiles the traveler with the variety of ferns on either hand and also with the wildness of the jungle, and foliage of many tints of green, to say nothing of the dash of flowers and blossoms now and again. Soon the Ranong hot springs are reached. In this water an egg can be cooked in five minutes. The sediment about is probably saltpeter. This water has been analyzed far enough to show that it is harmless as a drink, but not sufficiently well, so far as I know, to prove its medicinal value, if it has such. There are also hot springs in Krabee province at Long Klong. Near Pangnga town is a cave in a mountain lined with rich and shining beauty of stalactites, evidently lime stone. There runs through and out of this cave a pure stream

of cool water, so welcome and refreshing to the thirsty traveler, that he drinks again and again thereof. About the boundary line between Pangnga and Takuathoong, as they were before the union of the two provinces, is a land tunnel beneath a mountain forming a passage way entirely through. This is of much beauty naturally. It has been fashioned into a sort of Buddhist sanctuary. Then as the mountain encompassed plain of Pangnga is entered, the little valley is seen to be surrounded by rugged mountains covered with shrubs, vines, trees and jungle. Here it is terraced, and there it presents a side almost perpendicular, and yonder a gradual rise like the huge back of an elephant. In about the middle of this plain or valley is an elevation presenting a vantage ground for a fine view of as fine a piece of scenery as ever ravished the human eye. To one side of the valley is built a phrachdee (pagoda) almost against a mountain side. This is on a hill and it is reached by steps; the top once gained and a long breath taken to relieve fatigue, there is as in a semi-circle spread out before the vision the gem of all the Montone. Far away the rugged mountains wall in, lest it should escape by some enchantment, a panorama of rare beauty, the trees and jungle of the mountains, the various trees, vines and plants of the level country, the river like a silver band winding through it in its search for the sea, to one side a partial view of the little city, the tamarined, the cocoanut, the pradoo trees and all the others vieing with one another in endeavour to captivate and capture the human eye. Move to the east side and the sun seems not to rise until nine o'clock, move to the west side and the sun seems to set at four in the afternoon, so the cool waves of morning air and light come, floating into being the day on the one hand, and dissolving the day into night on the other hand. The two entrances to this valley among the mountains are at the north and at the south, so that the breezes entering at the north sweep down, cool and refreshing, to the south and the traveler feels that this is the place to abide in.

But we must hasten to the sea and away. All up and down the coast the rock islands and others bewilder one. These seem to have, geologically, been pushed right up out of the sea. And such fantastic and charming scenery meets the eye—wonderful shapes resembling ships, and elephants, and hay stacks, and camels, and dogs, and turrets, and turtles, and kangaroos, and swans, and

bouquets of flowers, at night like specters chasing one another on the sea, the sun setting in the splendour of many colors of blue, and purple, and emerald, and green, and red, and yellow, until the ship carries us away and beyond their sight.

Addenda.

Since composing the above, the writer recollects the following:

1. At Pangnga there is a curious phenomenon. Just at the base of a mountain, at periods of about twenty-four hours each, is heard the noise of rushing waters, and then a flow of these waters filling a small pool six feet long and wide. As the rocky formation of these mountains contains caves and tunnels and all sorts of wonders, this is simply a syphon, or a syphon and a half, which fills with the running water and then empties itself periodically.

2. The writer noticed a tree in the province of Krabee, which flourishes also in other parts of Siam, called the sadow tree (*ไม้สาโด*). The tender leaves and bloom of this tree, the Siamese use as an appetiser or tonic in their food. Its taste is a bitter one, leaving in the mouth after chewing the leaf a taste exactly like that of quinine. The writer has believed for years that this tree belongs to the cinchona family of trees. It is well worth a scientific investigation.

3. In the province of Takuapa, the writer discovered a cork tree, "*Quercus suber*." Upon my return there about two years ago the tree was dead. There did not seem to be any natural reason for its death, as it had reached a height of about thirty feet and measured some eight or ten inches through the trunk. Perhaps some of the natives had noticed our close observation of this tree and through some superstitious notion on their part destroyed it, or supposing its bark contained medicinal properties cut too much of it away and thus stopped the flow of sap.

4. One night at Ranong we felt a distinct shock of earthquake. This "tremor," no doubt, had vital relations with the hot springs which are about two miles from the town, and perhaps will be heard from again.

5. The writer has further learned that, from the islands off Trang and Kedah edible birds' nests are taken, at a value of 32,000 ticals each year.

ORDINARY GENERAL MEETING, 15TH JANUARY, 1906.

DISCUSSION ON REV. J. CARRINGTON'S PAPER.

Dr. H. Campbell Highet was in the chair, and the business before the meeting was the paper on Monthon Puket, by the Rev. John Carrington, M. A.

In introducing the lecturer, the Chairman said Puket should be becoming distinctly familiar to members of this Society. They had already had an interesting archaeological paper on that region by Mr. Bourke, and more recently they had sent them a remarkable historical work by Colonel Gerini, which might fitly be called encyclopedic. They were now to have another word—he did not know if it was to be the last word. Anyhow he had much pleasure in introducing Mr. Carrington, who took a great deal of interest in the work of the Society, and he was sure they would all listen with interest to what he had to say about Puket.

Mr. Carrington then read his paper.

At its conclusion the Chairman said that while archaeological and historical papers had their value, no less value should be attributed to such a survey as they had had from Mr. Carrington. Touching further on one point, he added that it had been of interest to him to learn that the Siamese in Monthon Puket dropped the first syllable of their words, as on the occasion of a visit he had paid to Kelantan he had found that the same thing held good there with regard to Malay. 'Ampat,' for example, was pronounced 'pat.'

Commander Ring, of the Navy, gave an interesting note on the Orang Laut (Chao Nam). A year or two ago, while stationed at Puket, he had to go out to find and chart a sunken rock on which a steamer was reported to have struck. He had with him a number of these people, who carried long hollow bamboos. By putting one end of these bamboos in

the sea and listening at the other end they were able to direct the progress of the gunboat, and finally, when they told him to anchor, the boat was quite near the rock, though there was at the time a dead calm and there was nothing on the surface of the water to indicate a rock. He had mentioned this to Professor Mohn, of Christiania, who was amazed, remarking that there was nothing new under the sun. The very latest device for locating rocks, etc., on the banks off the coast of Norway, was by using a telephone with wires connected down under the water. Monthon Puket was a part of the country of great interest, and he would be pleased to write some notes on it for the Society.

On the motion of the Chairman a very hearty vote of thanks was accorded to the Rev. Mr. Carrington for his paper, and the proceedings terminated.



It has been considered desirable, with a view to completing the local information regarding Phuket, to republish from the "Bangkok Calendar" for 1871 of the Rev. Dr. D. B. Bradley, an article which first appeared in the "Bangkok Advertiser" 1870. The article was most likely written by Dr. Bradley himself, who took a holiday trip to that place in 1870. It is reprinted as it appears in the Calendar:—

POKET.

For the Bangkok Advertiser.

A visit to Poket the principal town on the island of Junk-
ceylon.

The island of Junk-ceylon lays on the eastern shore of the Bay of Bengal. It runs nearly due North and South, being about 23 miles long and 8 broad. The southern part of the island is well bordered by high hills, the Northern more flat and swampy and therefore better adapted for the growth of paddy, of which more anon.

The island was, some few years ago divided into two provinces, and called *Salang* and *Poket*. Before this division the island consisted of only one province call *Salang*, the principle inhabitants of which were Malays, with only a few Siamese, and they cultivated rice and caught fish sufficient for their own consumption. Exports were unknown.

The present governor of the island was then *P'ra Palat*. He was sent to Poket when it was only a fishing village, and being an enterprising sort of a man, he determined to see what treasures were concealed beneath the soil, and was so far successful as to find something which he thought would in a few years amply repay the outlay which he might make.

The Chinese soon flocked in numbers to Poket, and *P'ra Palat* furnished them with funds to commence work, and the place

prospered and grew apace, when he was appointed governor; and now, what was then a paddy field, is covered with brick houses and a numerous population.

The immigration continued to increase, and now there are about 25,000 Chinese in Poket. They are divided into different factions and are continually at variance with each other. These men, during the S. W. monsoon, find plenty of employment at the Tin mines but during the N. E. monsoon numbers of them are idle, being out of employment owing to the scarcity of water for washing.

Tongka Bay is the port of Poket. A good road leads to the town, which is $1\frac{1}{2}$ miles distant from the Harbour Master's office, and that is about two miles from the junk anchorage.

Tongka Bay, lays in $7^{\circ} 51' 25''$ N. Lat. $98^{\circ} 20' 22''$ E. Long. Rise and fall of Tide, at Springs 12 feet. Best anchorage and deepest water about 3 miles from the mouth of the river. Bar 2 fathoms at low water.

There is a passage between the islands of Pulo Kapul Bazar and Pulo Kapul Katchee. By keeping close to Pula Kapul Katchee you will have four and five fathoms water into the anchorage.

The Chinese are mostly employed at the Tin mines, and the cultivation of the fields is neglected, notwithstanding that the soil is rich and good and well adapted for sugar, coffee and spices. Herein they have committed a great error, for when the Tin mines are exhausted, and they cannot last for ever, the population will be reduced to poverty and misery. Instead of all the Chinamen being employed at the Tin mines, were a portion of them to devote themselves to the cultivation of the country, a source would be opened up from which a greater amount of wealth would be derived than what has been obtained from the Tin mines.

During the N. E. monsoon most of the people are out of employment. Now if a certain quantity of land was allotted to each man, for a given number of years, and during his idle time, if need be, he was compelled to cultivate it, the amount of produce from that land would well pay him for his labor. At the expiration of

the time for which he held the land, he might be able to pay the government for the land, which could be sold to him at a reasonable price but subject to a small yearly tax.

The population is sufficient for working the Tin mines and also for the cultivation and for the land, consist of, Chinese 25,000, British, Malays. 200. Siamese, 300, Siamo-Malays 200, Total. 25,700. These occupy about one half of the island.

It is true the province of Tongka abounds richly with Tin. But why this province should be rent by factions when there is room enough and to spare for 25,000 in Salang, is beyond my comprehension, when Tin, Gold, precious stones and silver have been found here. But to occupy this, capital is required.

The climate is fine and healthy. Thermometer from 82° to 86° during the day, and from 75° to 78° in the nights, which are generally very cool and pleasant. Some days certainly are very hot, but I think on the whole cooler than Bangkok. Most of the houses have been built by the Rajah. The revenues are farmed out the same as in Bangkok. Gambling predominates much more than in Bangkok, and is the principle cause of so much trouble in the island.

There are about 60,000 piculs of Tin exported yearly, and an unknown quantity on private account. I can safely say that this is one of the richest islands Siam possesses, and if governed after the fashion of our English colonies, and by a governor receiving an adequate salary, it would yield an immense revenue to the Siamese government, true it would require two men-of-war to protect the trade, and a land force of 1,500 men but there would then be no danger of riots occurring among the Chinese.

I cannot close my remarks on this island without mentioning her sister ones lying more to the eastward. Across from Tongka Bay the high land of Pulo Panjang is visible. This is an extensive island with few inhabitants, and these chiefly Siamo-Malays. I did not learn accurately what the resources of it are, but it appears well adapted for cultivation. To the Southeastward of this island Pulo Lantar looms up. This island is reported to be rich and well adapted for the growth of sugar cane. Here the inhabitants are also Siamo-Malays.

The province of Lukon runs down to the sea shore between these two islands, and has a river running up it, of which I did not ascertain the proper name. Up this river there is a rich coal country, in fact the natives use this coal for daily cooking purposes. Surely Siam possessing such a coal district has no reason to purchase foreign coals, when she might not only supply herself, but also her neighbours with good burning coals from this district.

IMPORTS.

Memo. of articles imported into the port of Poket, Junkceylon, from May 1st 1869 to May 30th 1870.

Rice	2509	Koyans	Sugar Candy	260	Piculs
Salt	214	do	Iron	30	do
Opium	109½	Chests	Garlic	115	do
China Tobacco	996	Boxes	Onions	720	do
Vermicilla	560	do	Sugar cane molasses	100	Jars
Crackers	127	do	China salted vegetables	98	do
Tea	254	Boxes	Eu. mixed piece goods	922	Corges
Joss Sticks	27	do	Slandaang	130	do
Sundries	310	do	Malay Sarongs	25	do
Cocoonut Oil	2052	Piculs	Iron hoes	210	do
White Sugar	644	do	Grey Shirtings	72	do
Brown do.	2115	do	Iron ware	10	do
Hog's lard	1023	do	Acheen S. trowsers	15	do
Salt fish	5096	do	China do	228	do
Salt prawns	115	do	Roofing Tiles	35000	In No.
Macaronie	125	do	Flooring do	2000	do
Katchang Oil	122	do	Marantee planks	1654	do
Tallow Candles	248	do	Acheen Mats	860	do
China peas	742	do	China Hats	500	do
English Candles	10	do	Tubs	800	do
Wheat Flour	36	do	Common cups	30000	do
			China paper	404	Bales
			Joss do	11	do
			Java Tobacco	9	Baskets
			Dollars	\$66170	
			Gold	50	Bangkols

ANNUAL GENERAL MEETING OF THE SOCIETY.

(1906)

The annual general meeting of the Society was held at the Oriental Hotel on the evening of the 31st January, 1906.

Dr. H. Campbell Highet was voted to the chair, and there were also present:—Dr. C. Beyer, the Rev. John Carrington, Dr. O. Frankfurter, Colonel G. E. Gerini, Commander Ring, Messrs Belhomme, Bock, Brande, Carter, Crosby, Diemer-Hansen, Edwards, Homan van der Heide, and Mundie

The first business was the reception of the report and balance-sheet of the previous years (1905). These have already been printed in the Journal, Vol II. Part 1.

Mr. Belhomme proposed the adoption of the report and balance-sheet. Mr. Bock seconded, and this was at once agreed to.

The next business was the election of officers and other members of Council for the ensuing year.

The Chairman (Dr. Highet) was asked to accept the post of President, but as he was shortly going home on leave he had to decline that honour.

Mr. Homan van der Heide then proposed that Dr. Frankfurter be elected President of the Society. This was seconded by Mr. Diemer-Hansen, and unanimously agreed to.

Mr. Francis H. Giles, Mr. W. R. D. Beckett, and Dr. T. Masao were next elected the Vice-Presidents. Mr. van der Heide was also proposed, but withdrew to avoid a contest.

Mr. R. Bellhomme was appointed Hon. Secretary and Librarian; Mr. A. Cecil Carter, Hon. Treasurer; and Mr. W. H. Mundie, hon. assistant Secretary.

The following were appointed members of Council—Phya Prajakich, Rev. J. Carrington, Dr. Hays, Dr. Highet, Dr. Reyttter, Dr. phil. Stönnner, Colonel Gerini, Mr. van der Heide.

On the motion of Mr. Belhomme, seconded by Mr. van der Heide, Colonel Gerini was elected an honorary member of the Society. In putting the motion the Chairman added a word of appreciation of the work Colonel Gerini has done for the Society.

A vote of thanks to the Chairman then terminated the proceedings.

DINNER TO COLONEL GERINI.

On the eve of his leaving Siam Colonel G. E. Gerini was entertained to dinner by the members of the Council. The dinner was held at the Oriental Hotel on Saturday, the 3rd March, 1906. The President of the Society, Dr. O. Frankfurter, was in the chair, with the guest of the evening on his right hand, and there were also present: Dr. Masao, Rev. J. Carrington, Mr. Belhomme, Mr. Carter, Mr. Homan van der Heide, and Mr. Mundie.

Apologies for inability to be present were intimated from Dr. Highet, Dr. Hays, Dr. Stönnér, Dr. Reyttér, Dr. Poix and Mr. Giles.

The only toast proposed was that of the guest, Colonel Gerini. The President said:--Brevity, Shakespeare says, is the soul of wit and this, I take it, also applies to dinner or after dinner speeches. I can well understand that a politician or a member of parliament addressing his constituency to persuade them of a matter in which he himself does not believe or only half believes, may make a long speech. That does not apply to us. You know, gentlemen, that we are assembled here to do honour to our learned and gallant friend Colonel Gerini, who very kindly consented to spend one of his last evenings of his stay in Bangkok with us. I think it would be like carrying coals to Newcastle, or, as Colonel Gerini would most likely prefer to put it, "taking toilet powder for sale to the palace ladies," were I to dilate on what Colonel Gerini has done for Siamology. Twenty-five years in a man's life is a long space, the time from youth to middle age from middle age to old age. Many are the disappointments we have suffered, the ideals of our youth have vanished, and happy is the man who can through all the vicissitudes of life preserve the *aequa mens*, happy the man who has done his duty. Colonel Gerini, I take it, is in this happy condition. Happy in this sense that both in his official and private life he has found distinction and recognition. He has formed numerous friendships, he has advanced everything he took in hand, and happy he is also in this sense that he is enabled to leave a tropical country after twenty-five years residence, still full of life and vigour, so as to be able to continue his life task. I am selfish enough in this connection to express in the name of our Society the hope that he will give us the ripe fruits of his researches to be published in our Journal, which by his collaboration, as we are all aware, has gained additional value. I have nothing more to add. I request you, gentlemen, to raise your glasses and drink to the health of Colonel Gerini. I trust

that you will couple with it all the wishes for a prosperous and happy life "*procul negotiis*". (applause).—

In returning thanks, Colonel Gerini said the point of what he had to say was that he was exceedingly thankful to the Siam Society for the kindness and honour that had been done him. The work he had done for the Society was small, and he only wished he had been able to accomplish much more. But now that he was leaving the country he was glad to feel assured that the Society was in good hands. So far it had gone on very well, considering the difficulties that were to be expected in the first two years, but for the future he believed there were far better hopes than one was justified in holding in the beginning. He was quite certain the Society would increase in numbers, and the interest in the papers should always be greater as research extended over Siam. Siam was an almost unknown country so far, although many books had been published on it, since there were very few writers who had gone deep into the subject. There had been many visitors who came to the local hotel, and perhaps it was not astonishing that they went away and reported that the banana was the only fruit in Siam. The stories about mosquitoes had a similar origin. That, of course, was merely the humorous aspect of the question, but outside of that everyone agreed there was still a great deal of work to do in this country. This Society, therefore, should prove very, very useful, not only to the world in imparting useful knowledge, but also to Siam itself, because he believed Siam had been one of the most misunderstood countries in the world, and the better the people of other nationalities understood Siam and the Siamese, the more would be the good feeling between other countries and Siam. That, therefore, was one of the ways in which this Society could do very good work. Although the Society did not touch political questions, the imparting of true knowledge about Siam and its people to the world would be one of the benefits that would result from the existence of the Society. As he had already said, he was happy in knowing that he left the Siam Society in good hands, and his sincerest wish was that the Society might have continued prosperity, and that its work might more and more increase in all departments of research in this country. In concluding he wished to thank the Council for their great kindness and the honour they had done him in allowing him to spend a very pleasant evening with them. He wished prosperity to the Society, to its Patrons in this country, and to its honorary members in other countries.

A very pleasant evening was spent.



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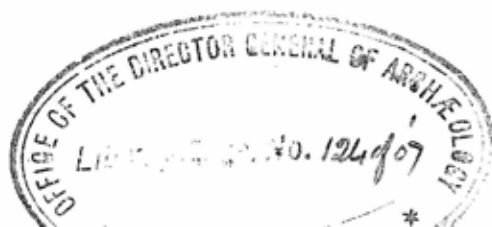
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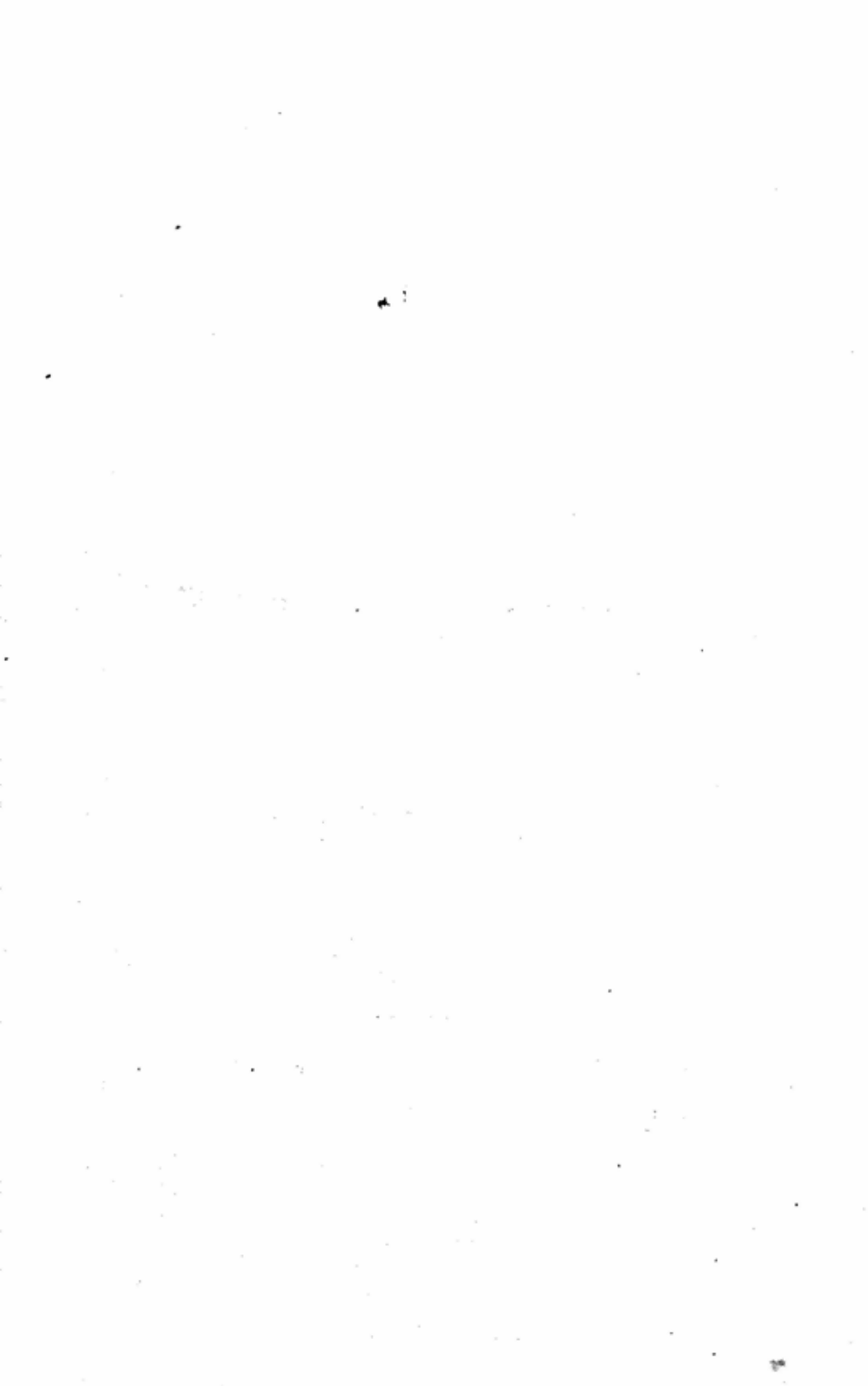
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THE SIAM SOCIETY.

(FOUNDED 1904.)

*For the Investigation and Encouragement of Arts, Science and
Literature in relation to Siam and neighbouring Countries.*

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The Society does not admit any responsibility on its part
for the views expressed by the contributors individually.
In transliteration each author has followed his own system.

Some Suggestions for Romanizing Siamese.

By O. FRANKFURTER, PH. D.

Transcription from the alphabet of one language into that of another is always a makeshift, unless indeed the two alphabets are only different symbols for the same sound. Such we may consider the Pāli Mss. written for instance in Burmese, Cambodian and Sinhalese characters.

We revert to transcription either for practical reasons, such as want of type, or with a view to showing the pronunciation of foreign words, or for scientific reasons with a view to showing the relations of languages written in different characters to one another: to find indeed a common medium between them in pronunciation.

We reach a relative state of perfection if we are able to express the symbols of one language (the alphabet) in that of another without any ambiguity regarding pronunciation. This state we have reached in the different alphabets of Indian origin, in which for instance Pāli is written, inasmuch as the symbols, though different in form, have the same value; and we have also reached a relative state of perfection in the so-called Hunterian system of transcribing Indian alphabets with European letters, *i. e.* romanizing them.

The question is more complicated if for practical reasons we have to transcribe the symbols of one alphabet into that of another in which, with a view to showing a different enunciation, we must use diacritical marks, or if the languages belong to different families.

It is known that the different geographical societies, with a view to gaining uniformity in reducing into writing names of places

etc., have laid down certain rules which are excellent in themselves, but which were only made, as is too often forgotten, for reducing to writing languages which apparently have no written symbols for expressing sound. The mistake made in applying these rules is that they are applied to languages with an alphabet. It is as if we were to give some English place-name according to French pronunciation or vice versa, or if we were to write for French *Lau*, O in English.

Now it is unfortunately true that people are apt to treat a language, the alphabet of which they are unacquainted with, as if it did not possess an alphabet; and they reduce to writing words they hear according to their own fancy, and are especially happy if, by this rendering, they can evoke some connotation appealing to their intellect. It is in fact the Hobson Jobson style of transcription, which is certainly amusing in some instances, but is, we may safely assert, never correct. To it we owe such terms as Upper roger, Opperrat (Dutch) for Uparāja, a form also appearing as Ombrat, the Umpire for Amphō, also written at the present time Umphur; and further the expression 'ballon', in the description of the French in the time of King Narayana, for the King's boats, as a rendering of the Pāli Siamese, pallaṅka, litter, palanquin. We find at the present time a "Book Club" for pudgal-labha (wealth of man) as the name of a money institute, a name which has now been changed into "Siam Commercial Bank," and the Pāli equivalent, as nearest in sound, found for it was สยามกัมมาจล meaning "Siam steady work."

This tendency then to reduce to writing words according to the way in which persons fancy they hear then pronounced can scarcely be called conducive to an exact knowledge, especially if the original connotation is made obscure. It is difficult, we think, in Siamese to recognize in the form "Payub" as the name of a Government Circle, the Pāli word Byāba, พายัพ, north-west

King Mongkut on several occasions rightly objected in his own forcible language to the curious way of transliterating Siamese adopted by the American Missionaries, and, in drawing already at that time the attention of scholars to the way of transliterating advocated in the Royal Asiatic Society's Journal, hoped that some improvement would take place. He wrote in view of the curious

way of dividing Siamese Pāli words in syllables, a practice which is not given up even at the present time:—

“Why is not the name of Mr. Knox printed thus, ‘Missa Nox’ or ‘Nawk,’ if the name of Chao Phya Bhuddharabhay is to be ‘P’raya Poo’ta’ra pie’? And why then is London not printed ‘Lundun’ or ‘Landan’ if Bejrapi is to be printed ‘Petch’abury?’”

We may therefore ask whether some simple rules may not be framed by which Siamese words can be romanized and which will enable us to reproduce these romanized characters in Siamese characters without ambiguity.

The only scholars who have tried to solve this question are the Roman Catholic Missionaries, and their system has been in use for the past seventy years and may be considered, from a purely practical stand-point, good, inasmuch as it is said that the converts after learning the Roman characters, find no difficulty in transcribing them into Siamese characters. But the system is far from perfect as we shall see. And it is said that transcription was only adopted because, in the reign of Phra Nang Klao, the Missionaries were forbidden to use, for their religious writings, the Siamese characters.

It is known that for 30 vowels and 43 consonants, 14 vowels and 20 consonants have been substituted, that no difference has been made between the letters of the three classes, the high, middle and low, and that consequently to mark the tones certain accents are used which have, as is known, a different value if they are placed over letters belonging to the different classes.

It will thus be easy to read and pronounce a Siamese text correctly, but it will be more difficult to retranscribe the romanized characters into the original Siamese, as no difference is made in transliterating the letters according to the class to which the letters belong and ᨧ, ᨨ, ᨩ ᨪ ᨫ are alike transcribed kho, ᨬ ᨭ ᨮ are alike transcribed pho, ᨯ ᨰ ᨱ=tho. Further no notice is taken of the original final letters, which are transcribed according to their pronunciation as ng, n, m, k, t, p.

It is therefore quite clear that the transliteration does not fulfil the requirements of science, but it has this great advantage that as far as vowels are concerned no ambiguity exists.

We may also refer in this connection to the attempt made in 1862 to adapt Lepsius' standard alphabet to romanizing Siamese. Dr. Bradley, in the Bangkok Calendar for 1863, writes in the course of his review of the noticeable events in the year 1862:—"Among the many noble objects embraced in the plans of the Prussian Embassy was that of establishing a 'standard alphabet for reducing unwritten and foreign graphic systems to a uniform orthography in European letters,' according to the plan of Dr. R. Lepsius, Professor at the University of Berlin. To this department Theodore von Bunsen, Esq. was devoted, and performed a good work while here, in preparing the way for writing the Siamese language according to that universal linguistic system. The editor of the Bangkok Calendar sees no serious difficulty in accomplishing this object, and fully intended to publish in this Number of his work, a table showing how Siamese words may be written by this new system. But the want of a few sorts of type has compelled him to postpone it a short time." The project has not been carried out, so far as I have been able to ascertain.

It will now be our duty to see whether a more satisfactory system of transliteration than those hitherto adopted, cannot be found.

For this reason it might be convenient to enquire into the origin of the alphabet. It is a fairly well established fact, that Siamese belongs to a family of languages such as Chinese which uses a hieroglyphic system to represent the spoken word. Thus the Chinese alphabet was adapted with more or less success for use in Annamese and Japanese, but Siamese which is closer related to Chinese, as it owes its whole civilization to Indian influence, adopted a syllabic Indian alphabet. During their migrations the Thai had not developed an alphabet of their own. They found, however, when they reached their present homesteads that these were inhabited by people who owed their civilization to Brahmanic influence and

who had consequently an alphabet adapted to the writing of an Indian language. The Thai under Phya Ram Kengheng of Sukhodaya adopted this Indian alphabet to reproduce their language and this fact is recorded in the Inscription from Sukhodaya now preserved in Wat Phra Keo, Bangkok, from which it appears, as has already been pointed out, that the Siamese alphabet dates from A. D. 1281 (Mahasakaraj 1203). Of course this Aryan alphabet to adapt it to the use of a Non-Aryan language had to be modified and this was done subsequently. The way in which these modifications were made are certainly ingenious and if the grammarians have not succeeded in smoothing over all difficulties as is shown by the difficulty we find in transliterating the alphabet, the means adopted by them were certainly skilful.

Now the original characters which were used for forming the Siamese alphabet were the following as used in Devanagari:—

Vowels:—

अ a आ ā इ i ई ī

उ u ऊ ū ए e ऐ ai

ओ o औ au

ः p visarga

ं anusvara

gutturals

क k ख kh ग g घ gh ङ ṅ

palatals

च c छ ch ज j झ jh ञ ṇ

linguals

ट t ठ th ड d ढ dh ण ṇ

dentals

त t थ th द d ध dh न n

labials	ပ p	ဖ ph	မ b	မ္မ bh	မ္မ m
semivowels	ယ y	ရ r	လ l	ဝ v	
sibilants	ရှ s	စ sh	ဇ s		
aspiration	ဟ h	ဖ် !			

It can be easily seen that this Indian alphabet could not without some modifications be used for reproducing the sounds of the Siamese language.

We have roughly speaking in Siamese the following sounds apart from vowels, which have to be reproduced by letters, viz :

k,	kh,	n,			
c,	ch,				
d,	t,	th,	n,		
b,	p,	ph,	f,	m,	
y,	r,	l,	s,	v,	h,

It can be easily seen that with a view to adapting the Indian alphabet to the Siamese language, it became necessary both as regards vowels and consonants to modify the original alphabet.

With a view to conformity certain letters have been added to the original Indian alphabet such as ဣ to represent a sanskrit ksh, further ဣ which only occurs in the Annamese word for neck khò.

The letters ဣ ဣ ဣ have been softened and were made to represent d, d, b, and consequently ဣ ဣ ဣ were added to represent the mutes t, t, p, whilst original ဣ ဣ d, မ္မ b have acquired the sound of aspirates and ဣ original g got hardened into the aspirate kh.

Some of the letters did not represent any sounds in the Siamese language and thus the whole series of linguals, the sonant

aspirates ข ฉ ฅ ฐ, could be discarded. Furthermore the ศ s and ษ sh also do not occur and are not written in pure Siamese words, and it is only a freak of the grammarians which prescribe ฐ ฐ in a few words, not of Indian origin such as เรอ ฐา. The sound represented by the letter y- ญ can be easily represented by the semivowel ย, in words of Siamese origin such as หญิง ย

The alphabet as so modified did not as yet meet the requirements of the language and the grammarians in modifying the shape of some letters reproduced the following alphabet.

ก ฅ ค ง
 จ ฉ ฐ
 ด ฒ ถ น
 บ ปร ผ พ พ
 ย ร ล ว ฬ ห ฬ

in which ฅ ฬ represent f.

They also divided these letters into three classes the high, middle and low class inasmuch as the accent placed over them affected their pronunciation and, thus we have in the middle

class letters: ก จ ค ฅ บ ปร
 k, c, d, t, b, p,

In the high class letters: ฐ ฉ ถ ผ ฬ ฬ ห
 kh, ch, th, ph, f, s, h

and in the low class ศ ง ษ ฐ ท น พ พ ม ย ร ล ว ฬ
 kh, n, ch, s, th, n, ph, f, m, y, r. l v h,

It will be seen that the high and low class letters form a complementary series and in order to distinguish their phonetical value it is necessary to put a diacritical mark on the high class such as printing them in italics, or adding a line or point to them, in so far as they are identical in sound.

Knowing that the accents ' ^u ^{ci} + affect the pronunciation inasmuch as they are placed over the different class of letters, we may when necessary in transliterating adopt the signs as used in the Pallegoix dictionary and in the publications of the Roman Catholic Missionaries, viz:

â altus, à demissus,

â circumflexus, a gravis, leaving the tonus rectus unmarked.

There is no objection to this plan if we remember that the use of these accents in old Mss. greatly varies.

If we now proceed to make some suggestions for a transliteration of vowels, we must once more repeat that we should use for every vowel or diphthong in transliterating vowels only, and we should not because of the Cockney pronunciation of English r revert to that letter to mark a long vowel, or because "aw" has in some instance the short O sound in English, use this in preference to a general recognized "O".

The value of the vowels should be the Italian one; but of course no transliteration will without the spoken word be satisfactory.

With regard to the transliteration of the vowels it is known that for purely practical reasons the Roman Catholic Missionaries only mark the short vowels, rightly contending that most of the vowels in Siamese are long.

Whilst giving due weight to their argument it appears more in accordance with general recognized principles that we should also mark in Siamese the long vowels in the few instances where transliteration must be reverted to.

In a transcription of the Siamese alphabet we should then mark the inherent short vowel (originally perhaps a) with o, and then further in accordance with the Indian vowel system.

ṛ ā ̂ i ̄ ī ṁ u ṁ ū

Further १० e १० ai १० ō १० au

The r and l vowels do not occur in words of Siamese origin and they must consequently be left out in pure Siamese words where they are replaced by ṛ ṝ, ṝ̄, ṝ̄̄.

These original Indian vowels were further modified to mark some peculiar Siamese sounds viz: u and ü sound by ū, ū̄, ū̄̄. We should transcribe them with u and ü and not perpetuate the barbarism of transcribing them by ur or er according to English pronunciation.

The visarga of Indian grammar is used to mark a very short vowel and for the same purpose a modification of the anunasika in the shape of ~ is used.

This sign is, however, comparatively new inasmuch as in old writings a very short vowel is marked by the duplication of the consonant and both signs can thus be transcribed with the sign for a short vowel ~. ʃ and ʃ̄ are modifications of the sound 'ai' which are at present pronounced alike. ʃ̄ never occurs in words of Indian origin and consequently their uniform transliteration by "ai" cannot lead to any ambiguity.

If we shortly sum up what has preceded, it is clear that owing to the origin of the Siamese alphabet it will not be possible to transcribe a lengthy text. Under ordinary circumstances we should adopt when necessary for words of Indian origin a transcription according to that system.

When the knowledge of such origin has been obscured, we should treat them as Siamese words :— **ṛṝ** and **ṛṝ̄** are scarcely felt any longer as having been taken from Sanskrit *Vara*, excellent, and *Varyas*, more excellent, and thus quite apart from the fact that they are some of the few words known in European languages, although the explanation of their origin remains for the writers on things Siamese as obscure as most things Siamese, we should treat them in transcription as Siamese words.

In most cases there will be very little necessity of using diacritical signs in transcribing Siamese into a European language ; but it is to be hoped that the Hobson-Jobson method of reproducing Siamese into European language will be given up, as the knowledge we may gain by a scientific transcription, would otherwise be lost.

Who would, to give only one instance, recognize in the word Sakate in "Wat Saket" one of the names of the old capital of Ayoddhya bestowed on a Royal temple, a name which we find moreover in Srisaket, ศรี สักเกต ?

Who would recognize in Tape, the word Deva (เทพ) ?



Secret Writing in Siamese.

BY O. FRANKFURTER, PH. D.

The desire to conceal the true meaning of writing from third persons has, as is well known, led to different kinds of secret writing. It is the writing of cyphers and codes which long employed in diplomacy may be said to have found its greatest development in this age of telegrams in the commercial world.

Several ingenious methods of such secret writing have existed in Siam from old times, but, unfortunately as in most things Siamese, we are quite unable to fix any date. It would however appear from internal evidence, the letters employed etc., that it is owing to Indian influence that the systems have been developed.

A collection of these cyphers, if we may so call them, has been made by Hluang Prasūt Aksaraniti (Phē) under the title of *Porānavākya*, in which other grammatical questions are also discussed, and which has been published by order of Prince Kitiyakara Varalaksana whilst in charge of the Education Department (Bangkok 120.)

We cull from it the following specimens in which there is a combination of letters and cyphers.

We find then first the numerals 1-9 employed to designate vowels in the following way.

๑	แป	สระ	๑
๒	๖	๖	
๓	๖	๖	๒
๔	๖	๖	๕
๕	๖	๖	๕
๖	๖	๖	๖
๗	๖	๖	๖
๘	๖	๖	๖
๙	๖	๖	๖

The following memorial verse shows how this system is to be employed,

๑. ๒. ทั้ง คู่ ไร่ ต่าง อ. อ. ให้ ดู จง ดี ๓. ต่าง เอ.
ได้ ๔. ไร่ เลห์ ที่ วิญญูณี ถิ ถ้วน ควร ถวิต ๕. ต่าง ผัด ไร่ ๖.
ต่าง โอ. โอ. ๗. ไร่ ต่าง พิน ๘. บัญญัติ อ้วน ต่าง โอ. จง ยิน ๙.
อัครา สิ้น เสร็จ สิ้น สารา.—It will be seen that none of the specific
Siamese vowels find a place in this system. We give the following
example and its decipherment:—

(๑)	๓๕๖๗ สิ้น สงวน คักค ๖๖	วงษ์ หงษ์
	๓๕๖๗ คักค ๕ ๖ ๕ ๕ ๕ ๕ ๕ ๕	๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕
	๓๕๖๗ ๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕	๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕
	๓๕๖๗ ๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕	๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕
	๓๕๖๗ ๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕	๕ ๕ ๕ ๕ ๕ ๕ ๕ ๕

(๒) ขรรคมคยชัรค
๙ ๙๖

ข้น ขม
๙

กน กีบับค ฅม
๙ ๙๕

ก ข
๙ ๖
๙

คน ช กถว นยม
๙ ๙ ๙

คว ว ฅน
๖ ๙ ๙๙

คบ ค นัน ช
๙ ๙ ๕ ๖

ฅย หน นน ฅน.
๙ ๙ ๙ ๙

(๑) เสย สิน สงวน ศักดิ์ ไว

วงษ์ หงษ์

เสย ศักดิ์ สฺ ประสงค์

ถึง รุ

เสย รุ เว่ง คำรง

ศคย อย่า เสย นา

เสย ศคย อย่า เสย สฺ

ชีพ ม้วย มรณา

(๒) ขรรคมคยา ไชรค

ข้น ขม

กน กีบับค ฅม

แก ไช

คน ช กถว นยม

ไกร ว่า คี นา

คบ ค นัน ไชร

ฅย หน นาน ฅน.

The second system is to substitute for vowels and accents consonants.

It will be seen that the r and l vowels are chosen to represent short and long i, and u ü and that consequently in this connection r and l are not considered vowels:—

คำ โคลง อุทาหรณ์

(๑) หังวตสทวตวตหัจ	วตวตวต
ตติกา ตาตตัต	แนก ไล่
จทรกร ไทรก ผลัก	เสียดค้ำ
ชื้อ ไบอรกพยก ไร่	ห้ายหาก เมตพร.
คำ แปล คือ เปลี่ยน ชื่อ กัน เอา ตัว นั้น เป็น ตัว นี้	
(๑) อักษรวรรณสารร้อย	ศรีสวัสดิ์
วนิดา นารีรัตน์	แต่ง ไว้
ยุบถกด โคลง พรัด	เพี้ยน ชื่อ
คือ ไทยหลง ผจง ให้	อาจอ้าง เป็นผล.

A system still used as a kind of intellectual exercise among children is the following:—

The consonants, leaving out the linguals and taking **ด ก ข** as one letter in the same way as **ห** and **ญ**, are divided into seven classes of five letters each irrespective of the grammatical class to which they belong. The series are marked by the numerals one to seven and the first letter of each series with one dot the second with two dots etc. For these dots the numerals from one to five may be substituted so that the alphabet so arranged would be as follows:—

อย่าง ที่ ๑

ก	ข	ฅ	ค	ค	ฆ	ง	จ	ฉ	ช	ฌ	ญ	ด	ต
๑	๑	๑	๑	๑	๒	๒	๒	๒	๒	๓	๓	๓	๓
๐	๐	๐	๐	๐	๐	๐	๐	๐	๐	๐	๐	๐	๐
	๐	๐	๐	๐		๐	๐	๐	๐		๐	๐	๐
		๐	๐	๐			๐	๐	๐		๐	๐	๐
			๐	๐				๐	๐			๐	๐
				๐					๐				๐
													๐

ก ก ก ก ก	ข ข ข ข ข	ค ค ค ค ค
๔ ๔ ๔ ๔ ๔	๕ ๕ ๕ ๕ ๕	๖ ๖ ๖ ๖ ๖
๐ ๐ ๐ ๐ ๐	๐ ๐ ๐ ๐ ๐	๐ ๐ ๐ ๐ ๐
๐ ๐ ๐ ๐	๐ ๐ ๐ ๐	๐ ๐ ๐ ๐
๐ ๐ ๐	๐ ๐ ๐	๐ ๐ ๐
๐ ๐	๐ ๐	๐ ๐
๐	๐	๐

๑ (ก ข ค) ก ข ค

๗ ๗ ๗ ๗ ๗
๐ ๐ ๐ ๐ ๐
๐ ๐ ๐ ๐
๐ ๐ ๐
๐ ๐
๐

ข้อที่ ๒.

ก ก ก ก ก	ข ข ข ข ข	ค ค ค ค ค
๔ ๔ ๔ ๔ ๔	๕ ๕ ๕ ๕ ๕	๖ ๖ ๖ ๖ ๖
๐ ๐ ๐ ๐ ๐	๐ ๐ ๐ ๐ ๐	๐ ๐ ๐ ๐ ๐
๐ ๐ ๐ ๐	๐ ๐ ๐ ๐	๐ ๐ ๐ ๐
๐ ๐ ๐	๐ ๐ ๐	๐ ๐ ๐
๐ ๐	๐ ๐	๐ ๐
๐	๐	๐

๑ (ก ข ค) ก ข ค

๗ ๗ ๗ ๗ ๗
๐ ๐ ๐ ๐ ๐
๐ ๐ ๐ ๐
๐ ๐ ๐
๐ ๐
๐

Attention may be called to a system of secret writing called
 ฤษี แปลง ตัว. The hermit metamorphosing letters.—This
 is simply writing any given text backwards.

(๑) ลิตธิรศอิทไ ฤนดบา
 งพลีณวทวซารสา มนุหน้า
 (๑) ลิตธิ อิศรไ ฤนดบา
 พง ถักวน ซาว สา หน่ม เหน้า.

A system of secret writing which is of course of universal
 application and which is known in Siam as ไทยนับสาม counting
 by three, and ไทยนับห้า counting by five, is the following :—

The text is written down. If we have for instance 23 words
 or letters we commence with the 8th letter which is written down
 and so on with every eighth letter. The third letter will then be
 the first of the original text.

It is the same when we divide

19 letters in 13
 17 „ „ 6
 26 „ „ 9

or counting five

19 letters in 4
 21 „ „ 17
 14 „ „ 3

The following may serve as examples:—

" ไทย นับ สาม . "

(๑) สี่ เหว เขอส์ เขอส์กุงกาสัตอวังถ

(๑) ขอ แถง แถงง ส่ารสร้อย ศุภอถ.

" ไทย นับ ห้า "

(๑) วัวร้อ โขงกกรว โขยทร

(๑) อักษร รรทง ไว้ โดย ขบวน.

As a touch of nature makes all people kin, we may mention that the worst feature of school boys' language, the back slang, is also met with in Siam. The syllable *ซ้อ* is added to the sentence and thus we may hear

ไป หนอ ไซ้	อยู่ บ้อ ช่าน	คิ่น นอ แล้ว ช้อน
ไป ไหน ซ้อ	อยู่ บ้าน ซ้อ	คิ่น นอน แล้ว ซ้อ
for ไป ไหน	for อยู่ บ้าน	for คิ่น นอน แล้ว

It is known that in some instances we find in Indian Mss. numerals expressed by words, i. e. instead of writing the numerals themselves, words are written which are supposed to have this meaning. Cpr : Burnell, A.C.: Elements of South Indian Palaeography. London, 1878. pg. 77. Thus for "1" we find the word for sun *aditya*, for 2 the word for moon *candr*. The numeral words are combined in the Mss. without indicating by any outward sign that they represent numbers. In writing these numbers one commences with the unit, then follows the decimal, then the hundreds etc., so that for instance the words which compose the figures 6321 would be written as 1236. It need not be pointed out that to the numerous other difficulties for a proper chronology, another is added by this cumbersome method, which may to a certain extent be compared to the chronograms in use in Europe since the sixteenth century, and in Persia and Arabia since the 9th century.

A similar secret method of indicating numbers we find also in some instances in old Siamese Mss. The method goes by the name of aksara saṅkhyā, the numeral letters. By its name its Indian origin is shown.

We find no indication at what time the system has been introduced and, although as regards secret writing it would lend itself to many combinations, it seems mostly to have been employed in astrological works.

The letters which are used for the forming of figures are those of the Indian alphabet and none of the specific Siamese letters enter into the combination. This alphabet is divided into three divisions of nine letters each called *navasaṅkhyā* and one of five letters *pañcasaṅkhyā* to indicate consonants, and the vowels with *ñ* and *n* for zero called *sūnasaṅkhyā* :—

* We have thus to indicate the numbers from 1-9 the following

၈	၉	၁၀	၁၁	၁၂	၁၃	၁၄	၁၅	၁၆
၁	၂	၃	၄	၅	၆	၇	၈	၉

၁	၂	၃	၄	၅	၆	၇	၈	၉
၁	၂	၃	၄	၅	၆	၇	၈	၉

ຍ	ຶ	ຸ	ູ	຺	ົ	ຽ	ຸ	ູ
1	2	3	4	5	6	7	8	9 and further to

Indicate the numbers from 1-5

1	2	3	4	5
---	---	---	---	---

Whilst for Zero we have the vowels

๑ ๒ ๓ ๔ ๕ ๖ ๗ ๘ and ๙

 ๐ ๑ ๒ ๓ ๔ ๕ ๖ ๗ ๘

The example is:—

ตาย ประมาณ ก, ญ, น, ปี เปน ค, ช, ฉา, ฤๅ

เป่น ก, ข, ฃ, น, เดือน เป่น จ, ฉ, ช, ฉ, บัณฑ์

๓ ๒ ๐ ๐ ๒ ๔ ๐ ๐

เป่น ถ, ห, อ, อ, ราชวัตร เป่น

ณ, ข, ฃ, น, เณ, ภัทร เวล

๗ ๒ ๐ ๐ ๐

Thus to indicate that a change of the era from the Buddhist to the Chulasakarat should take place, the word กหัง ปายา is used, where ก is the equivalent of 1, ห of 8, ป of 1 and ย of 1, meaning that the number 1181 is to be added or subtracted from the year of the Era.





The Economical Development Of Siam During The Last Half Century.

PAPER READ BY MR. J. HOMAN VAN DER HEIDE AT A MEETING
OF THE SIAM SOCIETY ON 22ND NOVEMBER, 1906.

I intend to give a brief treatise on the economical development of Siam, especially since the middle of the Nineteenth Century.

Economical treatises generally do not tend to be very entertaining.

The material of facts and figures economical treatises generally have to deal with is very liable to be classed by many people as a rather stern and wearisome stuff; and among these practical business men, otherwise well accustomed to stern and wearisome matters, some perhaps may think the subject to be too much of an academical character.

Nevertheless the economy of a country is a thing of extremely practical interest; for, its object is the whole system of production and exchange of the various commodities by which life in our organized human society is distinguished from the wandering life in the forests of our prehistoric ancestors.

It will be unanimously admitted that these various commodities certainly are of a very material and practical character.

The ways and means by which these various commodities are produced and exchanged form the basis of the organization of human society, and it is now generally acknowledged by economists that the ways and means of production and exchange of products have a predominant influence not only on the social and moral conditions, but also on the political history of humanity in general as well as of states and peoples in particular.

It is easy enough to show, as I did just now, that the objects of economy essentially have a practical and not a mere academical character; and in the mean time I had much pleasure, by involving in the case even such mysterious persons as our prehistoric ancestors, at least to give a slight hint in the direction that the science of economy is not so entirely devoid of romance as people may be inclined to suppose.

In regard to the special subject of this evening, however, I do not intend to go back as far as prehistoric times; and neither, will I bother you too much with figures, the last of course in the very first place in order to make the thing not more wearisome than is absolutely indispensable, and in the second place because regular data are fairly scarce in connection with this country in general and in regard to its economical conditions in particular.

I simply intend concisely to point out, firstly the outlines of the economical conditions in the old days, and secondly the causes and circumstances of the development during the last half century; finally I then will give some statements and data in regard to the present conditions of the country.

I.

If we compare the records and descriptions of the kingdom and the people of Siam as given by the travellers, merchants and missionaries of the sixteenth, seventeen and eighteenth centuries, with the descriptions stating the conditions of the country and the people which were written about the middle of the nineteenth century, then it is particularly

striking that in every direction the changes are very small and generally of no virtual importance.

During these centuries wars were waged; capitals were founded and destroyed; dynasties arose and have perished, one after the other; but the general conditions of the country and the people practically remained the same.

For many centuries already, from wandering hill tribes living chiefly on the produce of continuously changing fields, the Siamese had become a fairly sedentary agricultural people.

It is well known that these frequent wanderings of many hill tribes are not caused by their mere fancy for wandering, but simply by the fact that the clearings on which these people practice their agricultural operations generally, after a few years, are exhausted to such a degree that it becomes necessary to abandon them for a number of years and look for, and clear, other places, which seem suitable for a couple of years to yield a sufficient quantity of corn or rice.

When reaching the plains, the Thai people became fairly sedentary cultivators; for, in connection with the fertility and natural conditions of the land in the plains, frequent removals were no more necessary.

The tribal organization thus could make place for states of larger extent.

In consequence a more numerous and powerful ruling class sprang up, which could, and would, not partake of the ordinary labours.

Land, most suitable for cultivation, was still available in great abundance; in consequence land had no value.

Hands, however, for working the land were of course the more valuable; and, as has generally occurred in similar circumstances, the great and powerful in the state saw no better

way for securing on their own behalf the labour of the mass of the people than by enslaving them.

Of course, in regions where there is an abundance of most suitable land available for everybody who desires to work it, so that land practically has no value, by what other means than by main force and slavery can a man compel his fellowmen to work for him?

As soon, however, as the most suitable lands become occupied and consequently land is getting some value, the possessors of the most suitable lands, by their mere right of possession, can arrange to share in the produce of the work of their fellowmen.

Under the last circumstances slavery is no more a necessity for securing the labour of fellowmen; and in consequence, if not forcibly abolished, it generally is gradually vanishing away.

If however slavery is abolished prematurely, as regards the economical conditions of the country concerned, then this naturally will lead to the system of production being entirely disturbed and ruined to a great degree.

When thus we consider the various descriptions of Siam dating from the sixteenth up to about the middle of the nineteenth century, as a first point of importance it is obvious that the land in general scarcely has any selling value at all, whilst, in conformity with the preceding explanation, the great mass of the people is living in a condition of bondage.

The next predominating feature of the old economical conditions of this country, in its grand lines, is that it was a self supporting community, or rather combination of communities.

The material necessities of the great bulk of the people, apart from land and live stock, are practically summed up by enumerating their food, their houses, their implements, their dress, and their boats and vehicles.

The food, chiefly rice and fish, is now as before, of local origin.

The materials for the houses, wood, bamboo, attap, grass, wooden or earthenware tiles, were exclusively of local origin, as chiefly they still are at present, and were applied not by craftsmen, but by the householders themselves, generally with the assistance of their neighbours and friends, after a system of mutual help, which is a usual practice in primitive communities and at present too is still customary with most of the cultivators.

The agricultural and domestic implements also were of local make.

They consisted of materials locally obtained and were manufactured not only locally, but all over the country nearly exclusively by the husbandmen themselves.

Ploughs, harrows, carts, sledges, shovels, waterscoops, mattings, rough earthenware, boats, couches, all these things were of local and generally of domestic make, and chiefly consisted of materials everywhere available. Of course a few pieces of metal were practically indispensable for some of these implements; but with considerable skill people managed to reduce the metal parts to the utmost. And the metal indispensably wanted for implements, arms, etc., was produced locally, of course by primitive methods, from locally obtained ores with local labour.

Paper was also manufactured locally by primitive methods.

The dress in a country with a tropical climate is not such an important factor in human life as it is in the countries lying in a cooler zone. But nevertheless cloth also in this country is one of the principal commodities of everybody's use.

Dress in the old times was simple, as for the bulk of the people it really still is at present; and it was made of homewoven cotton or silk cloth, from homespun yarn of homegrown fibres.

Trade of course could only be of small importance in such a self-supporting primitive community.

The imports chiefly consisted of a small amount of luxuries for the court and the higher classes of the people. (Indian cloth, China porcelain, jewellery.)

The exports also were not commodities of general consumption, but chiefly products of a particularly high value (ivory, metals, deer skins, dyewood, for which articles Japan was the principal market.)

In the old days Siam was not a great country for trade.

Only luxuries and very valuable and little bulky commodities, like spices and such like things, valuable metals, fine cloths, etc., were the usual articles of trade at these times, before modern means of transportation had turned the more bulky stock generally to enter into the scope of the trade with the East.

As Siam, however, practically did not produce to any considerable amount such spices and valuable goods as in the old days were especially demanded by the merchants, the trade of the country could not become important, neither very profitable.

The old Dutch East India Company had a factory, as they called it in those days, in Siam for about two centuries. But the business was small, and the accounts concerning the results very often closed with a loss; in consequence the staff of the factory generally was very limited and often was withdrawn nearly entirely.*

It has been presumed that the principal reason of the trade of Siam in the old days being little flourishing was lying in the fact, that usually foreign trade was practically monopolized by the Kings.

Such monopolies of course are a great impediment to

* The principal business was the import of Indian cloth and the export of deer skins (up to 100,000 pieces) and sapanwood to Japan, and the export of tin from the Peninsular possessions of Siam. There was also some trade in rice. (Overzicht van de betrekkingen der Nederlandsche Oost-Indische Compagnie met Siam).

regular development of trade; but monopolising of trade by the King in the old days was fairly usual in other countries of the East as well, and did not prevent a comparatively flourishing trade springing up in such places, where products of general demand were available.

Of course such commercial monopolies always were very much against the desire of the foreign traders, as they could deal much more to their advantage with individual native merchants competing amongst themselves, than with a royal monopolist, who better could make them comply with his desire.

But, as I said before, monopolies after all did not prevent trade becoming comparatively flourishing where there was a natural basis for commercial transactions; that is to say, where the products of general demand of these times, or buyers for such goods, regularly could be found.

As regards a buyer of goods, however, in the old days Siam hardly could be counted very much, because it was fairly well a self-supporting community and necessarily it had to be so, as it had little or no products regularly to offer for sale, for which there was a general demand, and thus had little means to buy. *

* D. E. Malloch, an official of the English East India Company, in his "Siam," published in 1852, states the exports of Siam to amount to Tcs. 5,585,000, and the imports to Tcs. 4,331,000.

Amongst the articles of export teakwood does not appear; (used in the country itself, it is qualified; the price is stated to be Tcs 12½ per ton of 50 c ft.) Rice appears among the exports to the amount of 200,000 piculs only (price Tcs. 28—32 per coyan of 25 piculs), but it is stated that it may be had to meet any demand.

The principal items of export are stated as follows:—

Bark	...	...	...	...	Ticals.	110,000
Birds' nests	...	...	...	...	...	172,800
Cardamums	...	...	...	...	...	124,000
Cotton (raw)	...	...	...	...	...	450,000
Cotton cushions and mattresses	...	...	...	...	...	211,500
Fish	...	...	...	...	...	218,500
Hides	...	...	...	...	...	255,500
Iron and ironware	...	...	...	...	...	180,000
Dried buffalo and deer meat	...	...	...	...	...	120,500
Oil (cocoanut-, fish-, wood-)	...	...	...	...	...	101,000

II

Things, however, commenced to change when the continuous improvement of modern means of transport made transportation possible of bulky and cheap goods over great distances.

The easier and the less expensive transportation, especially by sea, gradually became, the more the character of trade in general became changed.

Formerly the main objects of trade had been luxuries and particularly valuable goods; but gradually the bulk commodities of daily use of everybody commenced to take the main place in the commercial relations, even between the most distant countries; and so those countries which could supply such commodities of general use more and more became centres of trade.

Siam soon proved to be such a country.

The bulk commodities which this country could offer for export are rice and teakwood.

These commodities it produced for centuries just as well as at present; but only in consequence of the development of

Rice	...	...	...	...	...	Ticals	150,000
Pepper	...	...	...	...	...		99,000
Skins	...	...	...	...	...		195,000
Tobacco	...	...	...	...	...		100,000
Tin and tin utensils	...	...	...	...	...		253,500
Sticklac	...	...	...	...	...		254,000
Sugar	...	...	...	...	...		708,000
Hog's lard, tallow and feet	...	...	...	...	...		146,000
Sapan wood	...	...	...	...	...		350,000
Agila wood	...	...	...	...	...		100,000

Mgr. Pallegoix, in his "Royaume Thai," and after him Sir John Bowring, in his "Kingdom and People of Siam," give the most fantastical figures concerning the trade as well as the revenue of Siam.

The figures of Malloch, however, are apparently founded on serious investigations by a man conversant with commercial matters, and though most probably somewhat exaggerated, on the whole they make a fairly accurate impression.

modern means of transport, these bulk goods have become main articles of trade. *

It is often presumed that the treaties with the foreign powers, in consequence of which the exportation of rice ceased to be practically prohibited, were the principal cause of the development of trade in this country.

But I think it is evident that the treaties and the abolition

* EXPORT OF RICE AND TEAKWOOD FROM SIAM FROM THE YEAR 1857
TO 1905, IN ENGLISH TONS.

Data provided by Mr. E. Ambrose, Asst. Director-General,
Customs Department.

Year.	Tons Rice.	Year.	Tons Rice.	Tons Teak.
1857	60,000.	1882	199,500.	...
1858	70,000.	1883	158,000.	23,500.
1859	50,000.	1884	284,000.	15,300.
1860	95,000.	1885	217,200.	15,200.
1861	123,000.	1886	215,400.	21,700.
1862	92,500.	1887	396,700.	21,100.
1863	104,000.	1888	449,800.	29,500.
1864	137,000.	1889	254,000.	43,100.
1865	2,100.	1890	475,100.	38,700.
1866	86,400.	1891	226,500.	16,100.
1867	111,500.	1892	203,900.	14,600.
1868	123,800.	1893	775,500.	24,500.
1869	160,000.	1894	507,400.	37,100.
1870	152,000.	1895	464,000.	61,800.
1871	110,700.	1896	457,600.	49,700.
1872	125,000.	1897	557,700.	44,200.
1873	51,500.	1898	519,200.	26,500.
1874	118,400.	1899	445,300.	38,700.
1875	233,600.	1900	414,400.	38,300.
1876	250,800.	1901	682,300.	50,400.
1877	185,000.	1902	792,300.	56,600.
1878	141,700.	1903	581,100.	58,100.
1879	240,000.	1904	837,100.	77,500.
1880	205,000.	1905	813,000.	101,400.
1881	221,000.			

The export of rice and teak greatly depends upon rainfall. After years of abundant rainfall follow years of great export of rice and teak; and after years of scanty rainfall the export is greatly reduced.

of the interdiction to export rice are subsidiary occurrences.

The sequence of reasons and consequences, it seems to me, is the following.

Development of modern means of transportation created a regular and increasing demand for bulk commodities like rice and teak.

In consequence of the regular demand for rice, the production became stimulated and increased; and development of trade ensued.

Under such circumstances, restriction or prohibition of export of rice as a rule must have soon ceased to be a necessary measure of economical policy.

For, in the old days under ordinary conditions, there was no *regular* foreign demand for rice. Only in cases of scarcity in any country the demand and the price rose high enough to make rice a desirable article of trade, but apart from that rice practically had no value as an object of foreign trade; thus in the old days there was no other stimulus for cultivation of rice than the local demand.

Local demand is based upon local consumption and upon what is wanted for storing up of reserves for bad years.

Occasional foreign demand in the old days generally occurred in consequence of failure of crop in neighbouring countries; and just because such demand was not a regular, but only an occasional and unforeseen occurrence, people could not possibly produce for it. In consequence such occasional demand could only be met at the expense of the local reserves.

A cautious Government of course could not allow these reserves to become liable to be exhausted; the more so as in general failure of crop and scarcity in neighbouring countries occurred simultaneously with local failure and dearth; consequently under such circumstances there was every reason for prohibition of export of rice.

But the *regular* demand for rice as a commodity for export, which had been created by the development of modern means of transport, acted as a great stimulus upon cultivation and caused the production regularly to increase so much, that subsequently under ordinary circumstances all prohibition of export became quite superfluous. Only in years of great failure of crop, prohibition of export could still be advisable. *

Precursory to the development of the rice and teakwood trade, sugar, cotton and fish had already become articles of export of some importance in Siam.

The value of these commodities per unity of weight, at that time, was at least 5 or 6 times greater than of rice, so that it is quite easily to be understood that these products, at an earlier period than rice, could become articles of some importance for general trade. **

But, as I stated before, the trade of the country did not gain real importance before cheap modern transportation had created a regular demand for such bulk products as rice and teakwood.

The development of trade, originated by cheap modern transportation, was facilitated considerably by the increased security in the commercial relations, which has ensued from the treaties with foreign powers.

Herewith the basis has been indicated of the new area of commercial enterprise in Siam; and I now will proceed to show the further development as regards the country and the people.

The first point to be set forth in regard to this development is, that gradually more money was coming into the country; and in consequence little by little the old economical fabric of

* In 1864, in 1865 and in 1877 export of rice was prohibited for some time, for fear of famine in consequence of serious failure of crop.

** In Malloch's "Siam" (published 1852) the price of cotton (cleaned) is stated to be Tcs 16-26 per picul, of sugar Tcs $6\frac{1}{2}$ - $7\frac{1}{2}$ per picul, of fish Tcs 7-8 per picul, and of rice Tcs 28-32 per coyan of 25 picul. (The tical at that time was equivalent to 2s. 6d.)

the self-supporting community, with what trade there was chiefly dependent upon exchange in kind, made place for the modern economical system, based upon cheap transportation, extensive commerce and exchange by means of money.

Another principal point is that when rice became a general product of commerce, people more and more applied themselves to cultivation alone and in consequence gradually commenced to neglect such other occupations, as did not prove to be as profitable or easy as rice-growing.

A third point of importance is that by rice growing becoming profitable, a demand for rice land sprang up.

As the most suitable lands of course had been occupied first, for extension of cultivation people had to take the remaining less suitable and less favourably situated waste lands.

From the advantages, the first occupied lands had above the new lands, the old lands soon commenced to derive a considerable selling value.

In consequence land became a valuable property, from which rent could be obtained.

Slavery and bondage under such circumstances lost their economical basis and ceased to be an indispensable institution; thus in course of time they could be abolished without any disturbance being caused in the system of production of the country.

The consequences of the alteration of circumstances gradually have led to the present conditions of the country.

The increasing importance of rice cultivation tended to lead people more and more to neglect other occupations, and this tendency was greatly enhanced by another result of the progress of modern transportation, namely the development in the manufacturing countries of the industries and trade of cotton goods, metalware, etc.

These goods of comparatively low value, and more still

the raw material required for manufacturing them, also benefitted greatly by the possibilities of modern means of transportation and sought a market all over the world, where any capacity for buying existed or came into existence by development of exports.

These goods of foreign manufacture could be offered to the consumers at a much lower price than the primitive local industries could make them for. Consequently in Siam, like elsewhere, the local manufactures and domestic industries were gradually superseded by imported products of foreign industries.

The general result of the opening up of the country for trade by development of modern transportation thus is that the people, from a self-supporting primitive community, have become large producers of agricultural products for export, and consumers of imported products of foreign industries.

In consequence the principal primitive local industries, namely those connected with cotton and silk goods, metalware, paper, earthenware, etc., have gradually died out. At present in Lower Siam these local industries practically have vanished away entirely.

Weaving and spinning, as in the old days was generally practised as a domestic industry by the women, has practically been dropped.

And with weaving and spinning also the local cotton growing has ceased, in consequence of the product no more being wanted for the local and neighbouring markets, and because the raw cotton is not of a sufficiently superior quality to be able to fetch paying prices in the general market. *

In former times the iron industry of Siam had some reputation in the East, especially in connection with the manufacturing of big iron pans for sugar boiling. * *

* About 1850 an amount of Tics. 450,000 worth of cotton was exported to China. But in China the domestic industries of cotton spinning and weaving and the import of cotton were supplanted by imported yarns and goods.

* * About 1850 there was still an export of iron and ironware amounting to Tics 180,000.

The primitive local metal industries and in consequence also mining and smelting of metals now have been killed by foreign imports; and therewith the charcoal burners lost their principal customers. With pottery and earthen ware-manufacturing to a great extent the same was the case.

Paper making was also of some importance in the old days, but has been superseded by foreign competition. Even such local industries as hat-making lost their hold upon the people and were generally supplanted by imported headgear.

Further sugar manufacturing and fishery must be mentioned especially.

Both industries once were comparatively important.

But as regards sugar manufacturing, an industry in all probability introduced by the Chinese, conditions of soil and water supply were not favourable enough to allow successful competition with foreign countries.

In regard to sea fishery this industry is still fairly flourishing, although comparatively it is no more as important as it was. People say the steamers are frightening away the fish from the once much favoured shores of this country; but I think it is more probable that people generally find rice growing and other occupations more attractive than fishing.

Navigation by sea to neighbouring countries, especially in connection with the cotton, sugar and fish trade and building of seagoing ships once were local industries of some importance; but now they have been supplanted entirely by foreign competition. *

On the other hand, apart from rice-growing and teak trade, new industries have sprung up.

Among these, rice- and saw-mills are to be mentioned in the first place. **

* In 1835, the Siamese first commenced to build square rigged vessels, and once there were a great number of these ships and junks in the hands of Siamese shipowners.

** In 1858 the first steam rice mill was erected in Bangkok.

Inland boatbuilding got a great impetus from the increased demand for inland transportation.

The demand for building materials caused brick, tile and lime manufacturing, etc., to become industries of some importance.

There is a tendency of boat and house building becoming a craft instead of a domestic occupation. The same is the case with the making of various implements and furniture as far as they are not imported ready made.

The various industries above mentioned are giving employment to many people, and more or less are taking the place of those industries which were killed by foreign competition.

And what further hands became available could easily find work in the continuously extending agricultural pursuits.

The economical evolution here referred to has thus led to great alterations in the whole social fabric of the country, by the changes in the system of production ensued from it, and by its gradually increasing tendency for specialisation of work, which has made itself felt in every direction.

The gradually increasing influence of foreign trade, it must be observed here, in the main is not due to the country being opened up, as it generally is called, by improvement of the inland means of transport, but simply to the fact that the progress of modern engineering had opened up the sea as a cheap way for distant transportation.

It is well known that under the last and during the present reign several navigation canals have been constructed in Lower Siam, and that more recently construction of railways has facilitated inland communication in various directions; but for the main part of the country, as regards the most important articles of trade, inland transportation is still in the same condition as it was half a century ago and before.

The country, however, is intersected by such a number of natural waterways, which are navigable at least during the high water season, that with the possibilities of inland transportation existing from of old a considerable amount of trade could spring up, as soon as a regular demand for rice and teakwood arose. But before the demand came into existence, the inland transport possibilities obtaining proved of no avail.

From this, again, it is evident that the *regular* demand for rice and teakwood, which chiefly was originated in consequence of progress of transportation by sea, was the real impulse which stimulated to an increase of the production in this country.

But of course this stimulus only in such places has led to results, where increase of production was feasible in connection with the conditions of the soil and the possibilities of inland transport.

It may be worth while here to state in which parts of the country and to what extent, up to the present, results have been attained from the change of economical conditions.

We then see that the teak producing territory is confined to the dry hill regions in the upper Menam and upper Salween basins, lying north of the 17th degree of latitude.

The rice growing regions, as far as export is concerned, are confined to the about triangular territory from Paknambo down to the coast, which forms the plain of Lower Siam and is generally styled the delta of the Menam, although it includes the plains of the Meklong and Bangpakong rivers.

As rice is by far the most important of these products, naturally I have to dwell a little longer on it.

Outside of the territory mentioned, practically no rice for export is cultivated.

This may for instance be inferred, according to transport investigations made in connection with the railway to the north,

now under construction, from the fact that the quantity of paddy coming from above Paknambo does not exceed round 120,000 piculs per year; and that the transport of paddy by rail from the Korat plain (eastward of Hinlap), according to the statistics contained in the ninth traffic report on the Korat railway, at the very highest only amounted to 200,000 piculs of paddy (in the very favorable Siamese year 124, or 1905/06) *

If we reckon 3 piculs of paddy equal to 2 piculs of rice, then we find the export from above Paknambo amounting to less than 1%, and the export from the Korat plateau only to about 1% of the total rice export of Bangkok (of about 14 million piculs in 1905.)

When considering matters closely, it is evident enough that it is not so much want of means of inland transport, as want of land suitable for cultivation on extensive scale, which hampers development of rice export in the north as well as in the eastern provinces.

Transportation, it is true, in these regions, apart from the railways, is only possible during a part of the year; but this is just as much the case in the greatest part of the rice exporting regions of Lower Siam.

And the river channels in the north and also the railway in the plain of Korat cover an area of land which ought to export many times more paddy than the actual quantities exported, if the land were suitable for cultivation on an extensive scale.

If we only take a strip of land of 10 kilometres at both sides of the line as being covered, as regards transport, by the influence of the railway, then the territory of the Korat plain covered by the line, if suitable for cultivation, ought at least to export a million piculs of paddy, to come

* Export of paddy or rice from above Paknambo, otherwise than passing Paknambo, and from the Korat plain otherwise than by rail, cannot possibly occur.

in the same line with the present circumstances in the delta. *

In the province of Korat, however, the people (400,000) have not yet quite one rai of paddy land per capita (total 350,000 rais), against three rais in Lower Siam.

Increase of production depends upon many other circumstances than upon inland transportation only; but an increased influx of products of foreign industries is rendered possible by transportation facilities alone. Improvement of means of inland transport, therefore, in many cases is more liable to increase the demand for imported articles of foreign industries, to the prejudice of local and domestic industries, than to increase the production for export.

It is evident that, in regions where the conditions for increase of production do not duly obtain, improved means of communication, in addition to demand for foreign goods, thus do not at the same time create the necessary increase of production for export.

In such cases opening up of a territory by improvement of means of communication only leads to killing the local and domestic industries of the self-supporting primitive communities by foreign competition, and to increasing the wants of the people for foreign goods. This of course is beneficial to foreign trade and industries, but greatly detrimental to the people concerned. A country of capitalists would be able to stand such conditions; but in primitive countries supplanting of the products of local and domestic industries by foreign imports easily may lead to economical and social disturbances and financial difficulties, if no compensation can be found in development of production in other directions.

If no compensatory increase of production arises, new imports have to be paid for, in the most favorable case, with reserves of foodstuff; and where increase of production of

* The territory covered, according to the presumption mentioned, is more than 100,000 hectare or 625,000 rais. If only about 50 per cent of this territory were cultivated, and 2 piculs of rice (equal to 3 piculs of paddy) per rai were exported, as obtains in Lower Siam, then the export of paddy along the line would be about a million piculs of paddy on an average, instead of 200,000 piculs as a maximum.

foodstuff is limited, export of reserves may easily lead to dearth or famine, not in consequence of absolute absence of food, because by the improved means of transport foodstuff could easily be brought back to such places, but in consequence of absence of means with the bulk of the people to buy anything whatever, food included.

The great zeal and interest generally shown in industrial countries for opening up of new countries is not at all without selfishness; and many peoples have suffered, and are still suffering very badly from the operation of their country being opened up in an inconsiderate way.

Of course this was not, and will not be the case in a country like Lower Siam, when and as long as opening up can be combined and preceded by a rapid increase of production for export.

But for many other parts of the Kingdom it is doubtful whether circumstances will take as favorable a turn.

III.

I will now proceed to state some data in reference to the present economical conditions of the country.

It was already pointed out that in regards to this, a clear distinction must be made between the plain of Lower Siam and the other parts of the country.

It may be of some interest first to ascertain what percentage of the crop at present is exported in the regions of Lower Siam.

No direct data are available by which this is shown; but it is nevertheless possible to give a fairly accurate approximation concerning this matter.

The total area under paddy cultivation in the rice exporting regions of Lower Siam, which embrace the 6 monthons (administrative circles) of Krung Thep, Krung Kao, Nakorn Chaisi, Ratburi, Nakorn Sawan and Prachin, in the Siamese year 124 (1905/06) was round 6,100,000 rais, according to the statements of the

Inland Land Revenue Office; and the total quantity of rice exported, which, as was explained, practically is derived from the plain of Lower Siam alone, on an average in the last 5 years (1901-05 inclusive) amounts to round 12,500,000 piculs.

In consequence the export per rai can be considered on an average to amount to about 2 piculs (of 60 1/2 kg.) of rice per rai (1600 square metres, *i. e.* about 2/5 of an acre).

There are no general records available here as regards the average yield of rice per rai; but according to various information and after comparison with what is known about the yield of the rice fields in neighbouring countries, it is fairly certain that an average yield of about 3 piculs of rice per rai can be taken as a fair approximation for Lower Siam. *

Consequently the rice export of Lower Siam on an average must amount to about 2/3 of the total yield.

It might be of some interest to add a few data as regards population and live stock of the rice exporting regions concerned.

The results of the recent census, which are considered to be fairly accurate, have supplied valuable material for this purpose.

According to this census, the population of the mentioned six monthons, which entirely comprise the rice exporting regions, in the Siamese year 123 (1904/05) amounted to round 2,080,000 inhabitants.

If we compare this number of inhabitants with the probable yield and the export of rice of the territory concerned, we find on an average about 6 piculs of rice available for export and 3 piculs of rice for consumption per head of population.

This figure of 3 piculs of rice per head of the population available for consumption is a very satisfactory feature of the economical conditions of Lower Siam.

* The average output in Java (irrigated and non-irrigated fields together) is about 13 picul of rice per bahu (7096 sq. metres, *i. e.* 4 7/16 rai).

The data concerning the professional occupations of the population, provided by the census of other countries which are in fairly similar conditions, show that it hardly can be too high an estimate for a nearly exclusively agricultural territory like Lower Siam, if we reckon that 75 per cent of the total population, or 1,560,000, are cultivators and their families.

In this way we come to an average of four rais of paddy land per head of the cultivating community, which for Lower Siam practically means the rice-growing population.* This makes 20 rais of paddy land per household, if the number of persons per household, as usually, is reckoned on an average at 5 persons. (In Burma, where social conditions are about the same as in this country, the average number of persons per household is five).

The extent of on an average 20 rais per household is fairly well confirmed by the results of the cadastral surveys, as stated in the annual reports of the Survey Department.

The average cultivator, with 20 rais of land, as was explained, gets an output of about 3 piculs of rice per rai, thus totally 60 piculs of rice, worth—at Tcs. 5 per picul—about Tics. 300.

Average gross earnings to this amount only, from which the taxes, eventually the rent, etc., have to be paid, cannot afford the average cultivator a much better position than an ordinary coolie has in this country.

Another point of interest is the number of live stock available.

The recent census gives the number of cattle and buffaloes for 5 of the 6 monthons of Lower Siam. For Krung Thep no data are available. For the 5 other monthons together the figures are

	491,000 head of cattle and
	501,000 buffaloes.
Total	<u>992,000 head.</u>

* Against round 6,100,000 rais of cultivated rice fields, there are only 320,000 rais of garden land, orchards, etc., in the 6 monthons of Lower Siam, thus just about 5 per cent.

The total extent of paddy land in the 5 monthons to which the above figures do refer, thus the monthon of Krung Thep not counted, is round 5 million rais, which makes about one animal per 5 rais of land, or 4 animals per household of cultivators, (at the rate of 20 rais of land per household).

For comparison it may be stated here that for Lower Burma, by a corresponding calculation, we find 22 1/2 rais of cultivated land and 2 1/2 animals per household of cultivators (of 5 persons).

These figures for Lower Burma, however, cannot straight away serve for comparison with Lower Siam, as Lower Burma includes the hilly regions of Arracan and Tenasserim, where similar conditions obtain as in the northern and peninsular provinces of Siam; whilst the figures for Lower Siam refer to the plain of Lower Siam only.

If as regards Lower Burma only the delta regions were taken into consideration, the average of the extent of land worked per household would be much larger, and the number of animals per household, in all probability, would prove to be smaller.

It is certainly not the cattle and buffaloes that fail in the outlying monthons of Siam, because there is nearly one animal per rai of land, against one on 5 rais in Lower Siam

For, if we add the 7 outlying census monthons of Nakorn Sitamarat, Korat, Pitsanolohe, Puket, Chumpawn, Chantaburi and Petchabun, to the 5 census monthons of Lower Siam, we find by a corresponding calculation on an average an extent of cultivated land per household of cultivators of 12 rais only, whilst the number of animals rises to 4 1/2 per household. *

* The extent of paddy land under cultivation in these 7 monthons was 1,330,000 rais in the Siamese year 120 (1901-02); the population was 1,820,000 inhabitants in 123 (1904-05); and in that year the number of cattle was 610,000 and of buffaloes 640,000, together 1,250,000 head.

The fact that in these monthons the people have less than one rai of paddy land per head of population, against 3 rais per head in Lower Siam, explains why the former regions do not export rice, whilst Lower Siam can export $\frac{2}{3}$ of its output.

But even with the hill regions included, it results from the mentioned figures that, on an average, in whole Lower Burma, with a much smaller number of animals, people, per household, work a considerably greater extent of land than in the plains of Lower Siam.

From this, one is inclined to infer that in Lower Siam the present population, with their abundant live stock, must thus be able to cultivate a considerably larger extent of land than they do at present; and local experience proves that this really could be the case. With the same number of 4 animals per household, in several districts of Lower Siam, in fact people on an average cultivate more than 40 rais of land, instead of 20 rais, per household.

But this requires more favourable conditions for cultivation than on the whole do obtain in Lower Siam. In Lower Burma, however, conditions are more favourable than in this country, in consequence of the rainfall being nearly twice as much.

The total extent of cultivated land in the 6 rice exporting monthons of Lower Siam in the fiscal year 124 (1905/06) was, as mentioned, round 6,100,000 rais.

The whole extent of the territory which comprises the rice exporting regions of Lower Siam, however, embraces about 15 millions rais. If 20 per cent of this extent, or 3 million rais, is reckoned to be required for houses, gardens, orchards, waterways, roads, etc., then there must be another 6 million rais of waste land available for cultivation, which could be made arable, if conditions would allow to do so, by the present population.

The land still available, however, of course is that which is not the most suitable for cultivation. That the remaining waste lands under present conditions are really not generally so very suitable for cultivation, is proved by the fact that people during the last eight or nine years have preferred to pay considerable sums for the lands opened up by the Rangsit canals, instead of taking up ordinary waste land which is available, without any payment, for everybody who wishes to cultivate it.

I now intend to consider briefly to what extent foreign trade at present has got hold upon the people of Siam

The statistics of imports can furnish some basis for such consideration.

It is well known that, just like the exports being chiefly derived from the plain of Lower Siam, also the imports of Bangkok are chiefly absorbed by these regions.

There is some trade of imported goods from Bangkok to the eastern provinces, and even to French Laos. These goods take their way by the Korat railway to Korat. The total of the trade of imported foreign goods to these regions, however, amounts only to about 5,000 tons, the traffic reports of the Korat railway taken into consideration, and cannot be estimated to amount to a value of more than $2\frac{1}{2}$ million ticals.*

Further there is the trade to the north.

The trade of imported goods to the northern provinces of Siam is said (in the British Consular reports, and by Mr. F. H. Giles in "The Kingdom of Siam" edited by Mr. A. C. Carter), to take its way for the greatest part from Burma.** As far as regards goods, the imports to Northern Siam taking their way from Burma are estimated at about a million Rupees, according to the reports of the British Consul at Chiangmai.

Thus if the imports derived from Bangkok are taken at Tcs. 2,000,000, I think they will not be considered as under-rated.

In the third place there is the coastwise trade of goods from Bangkok to the small ports of the Gulf and the Malay Peninsula, which amounts to not more than about 2 million ticals, the Customs reports taken into consideration.

* Mr. H. Warington Smyth, in his "Five Years in Siam" (1891/96,) estimated, evidently on the ground of competent authority, the imports to and via Korat at £60,000 (Tcs. 1 million) and the exports at the same amount. Mr. J. S. Black, British vice-Consul, estimated both together at £ 200,000 (Tcs. 3 million).

** Mr. H. Warington Smyth is of a contrary opinion, and estimates about £ 130,000 (Tcs. 2 million) for the foreign imports from Bangkok to the North (salt export excluded).

If we take these 3 items of the Bangkok trade together, they do not comprise more than 6 1/2 million ticals, or less than 10 per cent of the Bangkok imports of goods (on an average Tics. 69 1/2 million in 1902-05).

The remainder, making on an average an amount of more than Tics. 60 million, thus is absorbed by the 2,080,000 inhabitants of the rice exporting regions of Lower Siam.

This makes per head about Tics. 30, or per household of the whole population on an average about Tics. 150.

According to what has been explained, the extent of land worked per cultivator's family in Lower Siam is about 20 rais, and the crop about 3 piculs of rice per rai. The gross earnings of the cultivators on an average thus must be taken at 60 piculs of rice, worth about Tics. 300.

Of course, the imports per average household of cultivators are smaller than per average household of the whole population, because the cultivators are not the most wealthy class of the people.

But on the other hand they are the most numerous one. There is only one King, and there are more than 300,000 households of cultivators in Lower Siam. Imports to the amount of a million ticals for the King, thus make only little more than Tics. 3 per household of cultivators.

Moreover among the imports of Siam, articles of general consumption predominate very largely. The articles serving for production purposes, as machinery, raw material, and other articles for industrial pursuits, railway material, etc., do not amount to more than 15 per cent of the imports of Bangkok.

It is thus evident that the difference between the amount of the imports per average household of the whole population and per average household of cultivators is not so great as one might be inclined to presume; and therefore I

think it all but an exaggeration to estimate that on an average Tics 100 per year, or $\frac{1}{3}$ of the average gross earnings per cultivator's household, is spent on payment of imported goods.

The average amount of the imports of about Tics. 30 per head of the population in Lower Siam is already very considerable.

This development of foreign trade shows most evidently how closely the prosperity of trade is connected with the buying capacity of the people ensuing from extensive production for export.

If, however, we compare the above figure with the average amount of the imports per head of population in the countries of Western Europe (United Kingdom £12, Holland £15), it still makes a very poor appearance; but Egypt, which is an agricultural country like Lower Siam and at present enjoys great prosperity, does not show a higher figure of imports per head.

It is evident, therefore, that foreign trade has laid hand very strongly upon Lower Siam, its present conditions taken into consideration; but of course if production for export only increases at a faster pace than the population increases, this is no reason for uneasiness; on the contrary with proper development great possibilities for the future may still be expected.

For the other parts of the Kingdom, however, the amount of trade proved to be of comparatively little importance; indeed many times smaller than could be expected by the existing population and means of communication. But in these regions there is no production for export of any importance and in the consequence the possibilities of the import trade are limited very narrowly.

Apart from teakwood, which is worked by big foreign firms, the exports of the other parts of the Kingdom chiefly consist of live stock and jungle products. But the total of all the exports of Bangkok apart from rice and teak, amounts to about Tics. 10 million only, i. e. to about 10 per cent of the total of the Bangkok export in recent years.

These figures do not include the southern and western provinces of the Peninsula, which in addition to some cattle, pepper and jungle products, export about 5,000 tons of tin.

It needs not to be explained that in regard to Government revenue the plain of Lower Siam occupies a similarly predominant position as in regard to trade.

I have tried to point out in a brief way how the economical development of Lower Siam has resulted from the development of modern seaborne trade and from the favourable material conditions of the country.

Similar economical circumstances have led to similar results in other countries, which from political and administrative points of view are in very different conditions. But in different parts of the same country with the same political and administrative institutions a very different economical development does obtain, resulting from different economical conditions.

When seeing this, we must infer that economical results do not principally depend upon the political institutions and administration, but upon the economical conditions in the territory concerned and the efforts taken properly to utilize these conditions or, where necessary, to improve them.

Under the economical conditions of much importance, next to the natural possibilities of the country, are the natural abilities and social circumstances of the people.

In this regard the people of Siam have the advantage of being not hampered by prejudices of religion and caste, neither by unwieldy social institutions, like communal ownership of the soil or a burdensome village system, which tend to impede the development of individual energy.

Instead of the economical results being chiefly dependent upon the political institutions and the administration of the territory, these institutions and the administration, most evidently, much more depend upon the economical conditions

of the country; and necessarily they must do so. Otherwise the due proportions between the economical system and the political administration in some directions may easily be lost; and if the political and administrative institutions do outrun too much, or are kept too much behind the economical development of the country, the whole social fabric is liable to become topheavy or otherwise embroiled; and in consequence serious economical and financial disturbances may easily arise.

That in this country reforms in various directions could be successfully introduced, under this aspect, is greatly due to the advantageous economical development of Lower Siam during the last half century.

It needs simply to be stated here, after what has been set forth, that this advantageous economical development, and the favorable conditions by which it was brought about, evidently only obtain in the plain of Lower Siam.

In many other parts of the Kingdom, however, natural circumstances prove to be very different; and *there* in general economical conditions, in respect to increase of production for export, as yet have changed very little; in many places too little, I think, in order in future successfully to cope with the ever increasing influx of imported goods and the rising financial requirements of the Government.

ORDINARY GENERAL MEETING, 22ND NOVEMBER, 1906.

DISCUSSION ON MR. VAN DER HEIDE'S PAPER.

An ordinary general meeting of the Society was held at the Bangkok United Club on the 22nd November, 1906, to hear Mr. van der Heide's paper. The President, Dr. O. Frankfurter, was in the chair.

In opening the proceedings the PRESIDENT announced that the second part of Volume III. would contain some suggestions about the romanization of Siamese. Then as to future contributions, Mr. Polano was translating Van Vliet's description of Siam in the 17th century, and they had promises of papers from Mr. Beckett, Dr. Dunlap, Rev. J. B. Dunlap, Dr. Masao, and Mr. Giles. He now begged to ask Mr. van der Heide to read his paper on the economic development of Siam. The theme was one with actuality, and Mr. van der Heide's experience gave him the right to speak with some authority.

Mr. van der Heide then read his paper.

In inviting discussion, the PRESIDENT expressed his sense of the very valuable character of the paper to which they had listened. He was, however, of the opinion that sufficient stress had not been laid on the influence that the treaties of the reign of King Mongkut had exerted on the economic development of the country. There was already, a demand for rice and teak before the treaties were concluded, and the treaties enabled the demand to be met. Another factor to which attention might be drawn was the opening of the Suez Canal.

Mr. HAMILTON KING moved a vote of thanks to Mr. van der Heide for his very able paper.

This was seconded by Mr. BELHOMME, and passed with much cordiality.

The Rev. JOHN CARRINGTON said that if all had listened to the paper with the same interest as he had done himself, they would feel it was very profitable to have been present. But looking at the subject from a philosophic point of view, it was not only the industrial element that was important but also the intellectual element. In considering the economic development of the country, they might consider the Economics of industry, the Economics of education, and the Economics of all the outside influences in the line of civilisation. When he came here first in 1869, he did so in a sailing vessel from Hongkong. At that time there was only one regular steamer running to Bangkok, the old *Chao Phya* from Singapore, and soon after the *Bangkok* was put on the run. The second time he came was from Chefoo, also in a sailing vessel. But the output of the country, to meet the demand from outside which set the people to work, was very much increased after a few years, and the new Siam might be said to have commenced in 1851 with King Mongkut. As regards education there were only the schools connected with the Roman Catholic and other Missions. The native effort was only in the temples, and it was quite superficial. But since then there had been great progress in education, and now Siam had an intelligent body of young men and young woman capable of doing all the work required of them. When he came to the country women could not read. Now thousands of them were reading. They had not been in schools, but had been taught by their fathers and their brothers. Women were becoming more and more intelligent.

Mr VAN DER HEIDE said:—Mr Chairman, I should first like to thank you Mr. Chairman, Mr. Hamilton King and the Rev. Mr Carrington for the kind words expressed in regard to the paper I have read.

Further, as regards your remarks in respect to the treaties and the Suez Canal, I must say that what I especially wanted to point out is, that the economical changes in Siam are caused by the alteration of the commercial conditions, which have resulted from the development of modern transportation by sea.

Among the great engineering achievements which have contributed to this development of transportation by sea, the opening of the

Suez Canal, no doubt, is one of the most important; and for the East especially the Canal is of enormous importance. In consequence, just after the opening of the Suez Canal trade in this country increased by rapid strides. But I have not mentioned the Canal in particular, as it is only one among many modern technical achievements which have contributed to the development of transportation by sea,

The Chairman and also the Rev. Mr. Carrington have remarked that there was already a demand for rice and teak wood, before the treaties were concluded, and that soon after the treaties, rice- and saw-mills were erected one after the other.

This shows, I think, that it was the demand, created by improved transportation, by which the changes were brought about; whilst the treaties must be considered more as tending to meet the wants for security which originated from the development of trade.

As the Rev. Mr. Carrington remarked very rightly, it was the demand from outside which set the people of Siam to work; and I think this implies that it was not chiefly caused by political acts like the treaties.

Neither was it simply an act of policy of King Mongkut, which brought about the changes, however great the merits were of the late King as regards his country.

King Mongkut was an enlightened monarch who greatly possessed the ability of seeing and understanding the change of circumstances in regard foreign trade, and of feeling the consequences of this in respect to his Kingdom, and further of directing his policy in conformity with the altered conditions.

Of course, a bad Government can be detrimental to the economical development of its country; and a good King can do much, and King Mongkut, it is well known, has done very much, which was beneficial to the economical development of his Kingdom; but the fundamental causes of the economical development in this country must be sought in the development of transportation by sea, which brought such bulk products as rice and teakwood within the scope of general trade.

It is of course very natural that I especially have laid stress upon rice, as the importance of the rice trade is many, many times greater than of the teak trade.

The development of the country in material welfare, which was originated by the economical changes, has formed the solid basis on which education and progress in civilisation could be founded.

The PRESIDENT said that in 1848 Sir James Brooke came to Siam on a Mission, but he had to leave without making a treaty. Therefore, the President maintained, the way King Mongkut acted showed that he was a great man and that he understood his times.

MR. VAN DER HEIDE: That is what I said just now.

MR. HAMILTON KING suggested that it was the co-operation of the forces referred to that brought about the result. Touching on other considerations he pointed out that there were no richer deposits of tin anywhere than on Siamese territory, and that factor would enter into the politics as well as the economic development of the country. Siam, he proceeded, was young in its social and political fabric. It had a governing class eminently capable of conducting its affairs; it had a labouring class eminently capable of doing their work. The country was strong at the head and the foot; but there was no middle kingdom. What was needed was the development of the yeoman class, the wealth-producing, property owning, tax paying class. That class developed a love for the governing power which protected its homes; and that was patriotism. How was such a class, which was the backbone of a country, to be produced?

The Rev. JOHN CARRINGTON said some people often enquired how a middle class was to be produced in Siam. The question was already answered. Those of them who travelled about the country and came into close contact with the farmers, knew that this important element already existed. Some people said the Chinaman had this country, but that was said only by those who did not know the country, by those who knew only Bangkok and the larger cities. But some of them had travelled where it was rare to see a Chainaman, and where the yeoman was on his own land, holding the plough, sowing the seed and threshing the grain. Siam had a splendid school system, and what was wanted was that it should be extended more and more so that the young men and young women on the farms, and not only in Bangkok, should have the best of knowledge, and know how to make not two but ten heads of grain grow where one did now. There was no need to pray

Heaven to send the yeoman class, the backbone of the country. These people were here, and it was our duty to lift them up. Siam, he said in conclusion, was destined to a noble future.

MR. HAMILTON KING said the ladies and Siam were Mr. Carrington's sensitive subjects. Mr. Carrington said the thing was done, the desired middle class did exist. The thing was not done. But it was being done, and there was no country on God's foot-stool that had made such progress in the last five years as Siam had—no, not even Japan. He had been told that the Siamese was a lazy fellow, and that the Chinaman had to be got to do the work. From figures he had obtained he found that in some provinces only from 2 per cent to 5 per cent of the farmers were owners of their farms; while in the Rangsit district 50 to 60 per cent were owners and not merely tillers of the soil. That, in fact, he found, was the only place where the so-called lazy Siamese had an incentive and inspiration to work. As soon as they had the incentive of ownership, so quickly would they work. The Government was taking measures to produce that great change that they knew Siam was in need of.

Dr. MASAO said that in 1850 Japan and Siam were struggling away under the same yoke, and the same two men were guiding them at this yoke. One was Sir Harry Parkes, and the other Mr. Townsend Harris. These were the men who came and knocked at the door of Siam, made the treaties with her, and brought her to the notice of the world. They were the same men who knocked at the door of Japan, made the treaties with her, and brought her to the notice of the world. But there was one difference that might be worth noting and it was this. Sir Harry Parkes was favourably impressed by the progressive ideas of the late King of Siam, but he was so unfavourably impressed by the old fashioned ideas of the Japanese authorities with whom he had to deal, that on one occasion when he had the honour of dining with the Emperor, he actually had the audacity to tell the Emperor that on the Continent of Asia, on the hither side of India, there was a small country inhabited by a people similar in race to the Japanese, who were very intelligent and from whom Japan might learn. He hoped his Majesty might be pleased to send some one there to see how that country was doing and to learn lessons from that country. The Emperor did actually send a very high official to this country to see what lessons could be learned from Siam. But in those days Bangkok had no City Engineer and was a filthy place, so this high

Japanese official, with the almost religious regard for cleanliness of his race, was disgusted with the insanitary conditions of Bangkok, and, Dr. Masao was afraid, did not report favourably to His Majesty the Emperor. But from those days the two countries had been trying to advance in the same direction. They had the good fortune to have the same men, Sir Harry Parkes and Mr. Townsend Harris, to guide them; and it was a happy coincidence that both had been recognised as the progressive countries of the East. The late King was a progressive man, but the times were not quite ripe for his too progressive ideas. The country could not keep up to his pace; but now the time was ripe, and he quite concurred with the other speakers that in the last few years Siam had made more progress than perhaps any other country. Now that they had Mr. van der Heide to put into execution his schemes for the irrigation of the country and other capable gentlemen to aid in its development in other directions, he felt sure that the man who was fortunate enough to read a paper on the economic development of Siam ten or twenty years from to-day, would be able to say much more for Siam than what Mr. van der Heide had been able to say that evening, although it was already a great deal for Siam.

Mr. VAN DER HEIDE, replying on the discussion, said:—Mr. Chairman, after the eloquent and enthusiastic speeches we have just listened to, I feel somewhat reluctant once more to ask your attention for a few plain words.

But I should like to point out that in my present paper I only have tried to give a sketch of the economical development of Siam in the last half century, and to point out the causes of this development, and further I stated some data in regard to present conditions.

The facts and circumstances, connected with the economical development in the past half century I have mentioned and explained as they have impressed themselves upon my mind.

If, in addition to this, I had ventured into a review of the development of the future half or quarter of a century, I certainly would have pointed to the possibilities in respect to mining, irrigation and many other things; but mining has not considerably contributed to the development of Siam during the last half century, and irrigation is quite a new thing out here. As I had to deal with the past half century

only, I had no reason in my present paper to make excursions in any of these directions.

As the future is now under discussion, I further should like to say that I quite agree with Mr. Hamilton King, who says that a middle class is badly wanted in this country. A numerous, law-abiding, wealth-producing and tax-paying middle class who, by their properties, have interest in the country and its future, would give a strong backbone to the state, economically, and financially, and politically as well. Such a middle class would give stability to the policy of this country.

On the other hand I agree with the Rev. Mr. Carrington's opinion that this middle class is not absolutely failing now; or at least that the groundwork for such a middle class exists, namely that the already fairly numerous body of farmers who own land they work, must be considered as such. At present, however, the average conditions of the land-owning farmers are still much too closely approaching the standard of the coolie class. Average earnings of Tes. 300 annually from 20 rai of land, as I explained to obtain in Lower Siam, are not much superior to the earnings of an ordinary coolie in this country, and thus will not greatly entice people to become cultivators.

There is no doubt that a great number of farmers who work rented land are very desirous and are seriously striving to improve their condition, by getting permanent hold on the land. But in order to make farming more enticing, so that it will tend to originate a real middle class, the extent of land worked per family must be at least two or three times greater than the present average extent of 20 rai; and the value of the crops obtained per rai must increase also.

In this agricultural country it will not be contested that, in the next and even in a fairly far future, the cultivators only can form the main stock from which a fairly numerous, well-to-do middle class can spring up.

Mining and teak trade are businesses for big companies. These industries, like foreign trade and manufacturing industries, require too much capital to expect that they will especially tend to form a middle class.

In consequence, for promoting the rise of such a wealth producing, tax paying and law-abiding middle class among the people in this country, I

think, not in the first place social or political progress is required, on which people often especially lay stress; but before all a great economical progress is necessary.

The power and strength of the middle class is based on its economical position; and it is economically that the middle class is failing most in this country. Average gross earnings of Tics. 300 per year is certainly not the standard on which a strong middle class can subsist.

It is the economical basis which must be created first, by economical progress; this means, at least in Lower Siam, increase of agricultural production and in particular creation of the possibility of increasing the extent of land the farmers can work.

The farmers to raise their earnings, and therewith their standard of life, must work a greater extent of land by better methods.

When the economical basis of a middle-class is created, then education will tend to lead such a class to social and political progress.

But without the proper economical basis, I think, it can hardly be expected that education can have any result in the direction of social or political progress.

On the contrary, education without an economical basis is liable to create a class of déclassés, who certainly would make anything but a strong backbone for the country.

The PRESIDENT said he believed the Siamese were not so very badly off—otherwise how could they retain their crop for a year to wait for a better price? He hoped when the next Ambassador, such as Dr. Masao had referred to, came to this country he would find very much more reason for a favourable report.

The meeting closed with a vote of thanks to the Chairman.

THE ANNUAL GENERAL MEETING, 1907.

The annual general meeting of the members of the Siam Society was held at the rooms of the Engineering Society of Siam on Thursday the 31st January, 1907.

The President, Dr. O. Frankfurter, took the chair, and there were also present:—Mr. J. Antonio, Mr. W. R. D. Beckett, Mr. R. Belhomme, Dr. C. Beyer, Mr. E. Bock, Rev. John Carrington, Mr. A. Cecil Carter, Mr. E. Florio, Mr. Francis H. Giles, Dr. T. Masao, Mr. W. H. Mundie, Mr. C. Sandreczki, Dr. Stöner, Mr. E. W. Trotter, Mr. J. Homan van der Heide, Mr. W. J. F. Williamson.

On the motion of Mr. Carter, seconded by Mr. Giles, the minutes of the previous annual general meeting were taken as read, and were confirmed.

The President said the report and balance sheet (which are appended) were before the members.

Mr. van der Heide moved the adoption of the report. Dr Masao seconded. Agreed.

Mr. van der Heide moved the adoption of the balance sheet. Dr. Masao seconded. Agreed.

The next business was the election of officers and members of Council for the ensuing year, and

Mr. van der Heide proposed that the Chairman be re-elected President. This was seconded by Mr. Beckett, and carried with acclamation.

Mr. van der Heide proposed the re-election of Mr. Belhomme as Hon. Secretary and Librarian. The President seconded. Agreed.

Mr. Beckett proposed the re-election of Mr. Mundie as Hon. Asst. Secretary. Mr. van der Heide seconded. Agreed.

The President said they were all very glad to have had Mr. Carter as Hon. Treasurer, and he proposed that Mr. Carter be asked to retain that position. Dr. Masao seconded,

Mr. Carter said it would be impossible as he was going on leave, and would be away for some months.

In the end Mr. Carter was prevailed on to accept re-election.

A ballot was then taken for the election of the three Vice-Presidents. Mr. Beckett and Dr. Masao were re-elected, while there was a tie between Mr. Giles and Mr. van der Heide.

Mr. Giles asked to be allowed to withdraw, and Mr. van der Heide was declared elected.

By the same ballot the election of eight members of Council was decided. There were elected Mr. Giblin, Dr. Beyer, Dr. Highet, Rev. John Carrington, Phya Prajakich, Mr. Bourke, and Mr. Giles, while there was a tie between Dr. Stöner and Mr. Sandreczki. Dr. Stöner withdrew, and Mr. Sandreczki was declared elected.

A vote of thanks to the Chairman, proposed by Mr. Florio and seconded by Mr. Bock, concluded the meeting.

REPORT FOR 1906.

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The Siam Society—which was constituted on February 26th 1904—is now beginning its fourth year of existence and, in accordance with its statutes, the Council, appointed at the last Annual General Meeting, have now to retire from office.

The membership has somewhat fluctuated in 1906 but stands at present at 132 members against 134 in 1905. In a city such as Bangkok, and a Society mainly composed of foreigners, such fluctuations are inevitable, and vacancies caused by departures, resignations or death have been as quickly filled up by the enrolment of new members.

The Council have, nevertheless, to regret the almost complete absence of Siamese from its membership list. It is, however, hoped that, as its objects and aims become better understood and appreciated, they also will contribute to the success of the Society, which is under the high patronage of Their Royal Highnesses the Crown Prince and Prince Damrong.

In past reports mention has been made of the support received from kindred Societies in French Indo-China, Java, the Straits, Burmah and India. The expiring year has met with still warmer tokens of appreciation and encouragement from the same scientific bodies, and it can be said that the Siam Society has already been admitted into the ranks of these influential and prosperous associations devoted to Asiatic research. The numerous enquiries for exchange of publications are a proof of this.

The Publications received during the year are :—

Commandant Lunet de Lajonquière : *Ethnographie du Tonkin Septentrional*.

Annual Reports of the Smithsonian Institute.

Bulletin de l'Ecole Française d'Extrême Orient, Hanoi.

Bulletin de la Société des Etudes Indo-Chinoises de Saigon.

Journal Asiatique, Paris.

Publications of the Bataviaasch Genotschap van Kunsten en Wetenschappen.

Bijdragen tot de Taal Land en Volkenkunde van Nederlandsch Indie.

Straits Branch of the Royal Asiatic Society.

Journal of the Malaya Branch of the British Medical Association.

Journal and Proceedings of the Asiatic Society of Bengal.

Report of the Archaeological Work in Burma.

Mitteilungen der Deutschen Gesellschaft für Natur und Völkerkunde Ostasien, Tokyo.

Through Mr. C. O. Blagden :—

Buch des Rājawan der Königsgeschichte, von P. W. Schmidt, S. V. D., Wien, 1906.

Mast and Sail in Europe and Asia, by H. Warrington Smyth, London, 1906.

All these publications are open to the inspection of members by application to the Hon. Secretary.

As to our Publications, during the year under review, the members of the Society have received Volume II, which stood in arrear, and also Part I of Volume III; a further instalment belonging to Volume III, will soon be issued. With a view to placing in the hands of members, the papers as soon as read and discussed, the Council have decided that, in future, each paper will be printed and distributed as early as possible, in pamphlet form, instead of waiting for the accumulation of sufficient contributions to form a volume. It is hoped that this step will prevent arrears and also help to keep the Society and its transactions alive in the minds of its members.

The Council regret the departure from Siam of their most energetic and valuable member in the person of Colonel Gerini. At the last Annual General Meeting the members showed their appreciation of his services by appointing him an Honorary Member, the highest distinction they could bestow on him.

The Papers received during 1906 have fallen somewhat short of the number promised. When it is remembered that Siam contains as yet few men with sufficient leisure to write papers requiring long and careful research, this can easily be understood. Among contributions promised which, it is hoped, may be ready during the coming year, are :—

A translation, from the original Dutch, of Van Vliet's report on Siam (published in Leyden, 1692), by Mr. Polano,

Notes on the Geology of the Malay Peninsula	} by Mr. Belhomme.
The Thai race in Northern Tonkin.	

Siamese Medicine, by Dr. Beyer.

Siamese Temples, by Dr. Frankfurter.

The Conquest of Ayuthia according to Burmese sources, by Mr. F. H. Giles.

Continuation of Dr. Masao's paper.

Siam is a country as yet but superficially known to the outside world and, in the present state of knowledge concerning her, every contribution, small or great, which may tend to throw light on her, or help to make her better known and appreciated, will be welcome. It may interest members to know that the Foreign Office has manifested its appreciation of the work thus begun by asking the Society to allow a special reprint of Dr. H. Campbell Highet's valuable paper on "Climate and Health in Bangkok." How far members can contribute to the aims of the Society, all can appreciate for themselves by referring to the list of subjects, on which contributions are invited, as drawn up by Colonel Gerini and printed at the end of Volume I. Reference to that list will convince all earnest workers of the vastness of the field open to our Society and also of the possibility for everybody to contribute towards and promote its aims.

The goodwill and interest of all its members are earnestly invited, by the retiring Council, for the development and prosperity of the Siam Society.

R. BELHOMME,

Hon. Secretary.

BALANCE SHEET, SIAM SOCIETY, 1906.

	Tcs.	Cts.		Tcs.	Cts.
			To.		
By Balance 1905 ...	1,177	65	Journal, 1905 1st Part	994	—
„ 123 Subscriptions	2,460	—	„ „ 2nd „	1,202	77
„ Sale of Journal ...	45	—	„ 1906 1st „	417	81
			Plates printed at Survey Department ...	192	78
			Stamps	20	—
			Printing-Notices etc.	57	50
			Balance	797	79
Total	3,682	65	Total	3,682	65

A. C. CARTER,

Hon. Treasurer,

Bangkok, December 31st, 1906.

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