

TROPICAL DISEASES IN BRITISH NEW GUINEA,

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British New Guinea, or the Territory of Papua, as it was officially styled when it became a Territory of the Australian Commonwealth some three years ago, comprises the south-eastern fourth of the great island of Papua or New Guinea, with the islands to the south and east thereof. The corresponding north-east fourth, with its islands, belongs to Germany and the western half of the island to the Dutch. The area of the British territory is about ninety thousand square miles, by far the greater part of which is unexplored. This is also the case as regards the German territory, while of the interior of Dutch New Guinea practically nothing is known. The British territory lies between 5 and 11 south latitude. The native population has been variously estimated at from 300,000 to 3,000,000, but there is no foundation whatever for a reliable estimate. The natives are Papuans, ranging in colour from sooty black to chocolate brown, with huge mops of frizzy hair, and varying much in physique, some of the eastern islanders being quite dwarfish, while the natives of some other districts are well up to the European average in stature. In some places, especially along the western coast, there is an admixture of Malay, and on the eastern coast and among the eastern islands, of Polynesian blood, but the Papuan type predominates everywhere. Except where they have been brought in contact with Europeans for some time they are naked cannibals, literally still in the stone age, although they cultivate gardens and have fixed habitations, on the earth or in houses built in trees or on piles in the sea.

The climate is hot and humid along the coast line, the annual mean at Samarai being 79·5, humidity 80, but quite bracing in many parts of the interior, where the peaks of the great mountain ranges rise to heights of over thirteen thousand feet. Throughout Australasia the climate of New Guinea is regarded with terror, and the country has much the same reputation, in the antipodes, as the West Coast of Africa formerly enjoyed among ourselves. This idea is certainly not borne out

by the facts of medical observation, for, considering its geographical position, it is singularly free from many of the diseases which are common in other countries within the tropics. I believe that a certain confusion exists in the popular mind owing to the similarity in names between New Guinea and the Guinea coast of Africa; and the disastrous results which have followed when the discovery of a new gold-field has caused a sudden influx of miners, ignorant and careless in matters of Tropical sanitation, have only tended to confirm this unfavourable impression.

The total European population is about seven hundred. Of these, one-fourth are missionaries and their families, another fourth Government officials and their families, and the remainder miners, traders, planters, etc. Alluvial gold-mining is the principal industry of the country, most of the miners coming from Australia and all employing native labour, which is under Government control. Coconut and rubber planting is becoming important.

There is a remarkable absence of large wild animals, the pig, wallaby, and a harmless animal similar to the Australian bear being all that are known. Alligators, however, infest the rivers. The most striking feature about the fauna of the country is the immense number and variety, even for the Tropics, of gay-plumaged birds, chief among them being the bird of paradise in all its varieties. Whether the absence of wild animals has any connection with the comparative rarity of tropical disease is a question which is perhaps worthy of consideration. It probably accounts, to some extent at least, for the universal practice of cannibalism among the natives. Pigs are treated with great consideration and are only killed for great feasts. It is quite common to see, in a native village, a woman suckling a little pig at one breast and a baby at the other. The bodies of prisoners captured at war appear to the natives as natural supplies of animal food, which it would be folly to waste.

There are only three qualified medical men in the territory. One of these is a magistrate, so the medical staff consists of only two qualified men, one of whom is stationed at the oldest settlement and seat of Government, Port Moresby, and the other at the larger and more modern settlement of Samarai, which is the distributing point for the goldfields, and the place where three-fourths of the native labour recruits pass their examination. There are hospitals at both places, and the

three native hospitals at Samarai—general, gaol, and special or lock—usually have about seventy inmates. The ordinary difficulties of medical work in such a country are accentuated by the multiplicity of dialects, or rather, of languages. Until recent years there was very little inter-communication between villages—the hand of every village was against all its neighbours—and the people from villages only a few miles apart are often quite unable to communicate with one another by speech, even now. This difficulty is becoming less as time goes on, but constitutes a great impediment to our work, as interpreters are few and utterly unreliable. A few days ago I showed a very typical case of yaws to six of the patients in the native hospital here and asked each for his name for the disease. These six boys all came from within a radius of fifty miles from Samarai, and I got five different names for yaws.

Among Europeans, malaria and dysentery, with their complications, are the important tropical diseases met with. These are also common among the natives, although malarial manifestations are usually milder than in Europeans.

I collected specimens of mosquitoes from seven different places in the eastern half of the territory, including two of the outlying islands, and submitted them to Professor THEOBALD when I was in England last year. The only anopheles present was the *Cellia punctulata*, DONITZ, and this was found among specimens from all the seven places. This insect has been shown to be a malaria-bearer in German New Guinea. I have recently come across another mosquito with the same wing marking as *Cellia punctulata*, but with banded legs, and have forwarded some of these to London. I do not know of any efforts having been made to identify the malaria-bearing mosquitoes in any other part of the country.

Malaria is common along the coast line and along the river valleys throughout the territory. There is considerable malaria on the gold-fields, which are from 500 to 1,500 feet above sea level, and from 50 to 80 miles from the coast. I have never succeeded in getting a specimen of anopheles from any of these places, and, as far as I can learn, they are not to be found. The miners come to Samarai once a year, to pay off their labourers and get others, and generally also to get medical advice. Most of them stay here for a month or two, enjoying themselves after their own fashion, and when they return to the fields they

generally spend a week or more at the point on the coast at which they land, before starting on the journey inland. Before arriving at their destination, or soon after, they often develop malaria. Of course this was contracted on the coast, but it is difficult to make these people realise this, and still more difficult to get them to take precautions while in the danger zone. Instead, they triumphantly point to these attacks of fever as evidence of the weakness of what they call "the mosquito theory." It is only fair to say that there are exceptions among them. Inefficient treatment, usually by insoluble preparations of quinine in bullet form, results in a condition of chronic malarial poisoning which lasts until the next visit to Samarai or until the man dies. It is principally among these men that blackwater fever occurs. Occasional cases of this condition are also seen in traders, missionaries, etc., but only in those who have lived similar lives, as far as malarial infection and inefficient treatment are concerned.

The simple tertian and æstivo-autumnal or tropical types of malaria are found in about equal proportions. Pernicious attacks are rare, especially among natives. I have never seen a case of quartan fever here, or heard of one anywhere else in British New Guinea. In this connection, an interesting and suggestive fact was mentioned to me by the Medical Officer at Friedrich Wilhelmshafen, in German New Guinea, whom I saw while on my way home last year. He stated that on a group of islands about a hundred miles from that port, known as French Islands, on which there is a German population of eight, the quartan was the only type of fever known. This type of malaria has not been observed at Friedrich Wilhelmshafen where the parasite of tropical malaria abounds.

Considering the doubt expressed by high authority as to the connection between malaria and blackwater fever, I feel some diffidence in making any suggestion, but, in every case which I have seen in the past five years, the patient had suffered from many attacks of æstivo-autumnal or tropical malaria, produced by the so-called malignant tertian parasite, in the clinical manifestations of which infection it requires a very vivid imagination to discover anything tertian at all. Repeated attacks of this irregular fever, improperly treated, have preceded the attack of blackwater fever, the exciting cause of which, in several cases, has apparently been a dose of quinine.

This pre-existing condition of long-standing malarial infection agrees with my experience of blackwater fever in various parts of the tropical world during the past eighteen years, and it has occurred to me, in view of this experience, that in the comparatively rare instances where blackwater fever has occurred soon after the arrival of the patient in a tropical country, some other condition tending towards hæmolysis might reasonably be assumed to exist. Of course, this is pure assumption, but as a working hypothesis it is useful, for it seems necessary to give a long-continued course of anti-malarial treatment if a recurrence is to be prevented. In the last twelve cases which I have seen I have only found parasites—the small ring form—in two instances; but one would hardly expect to find them often. All of these twelve patients have recovered, the treatment having been by saline solution. Quinine has been cautiously given, in solution, as soon as the urine became clear, and in two cases appeared to cause a return of the black urine. It seemed that, the reaction having not yet taken place, the hæmolytic influence was still dominant and was increased by the quinine. Since using the normal saline I approach a case of blackwater fever with much more confidence than I did previously. I have been applying the principle of Murphy's method of proctolysis, and have very rarely had to resort to subcutaneous or intravenous injection. The improvement in the general condition of the patients and the lessening of the discomfort and distress have been very striking. A steady effort is being made to induce people, when away from medical assistance, to take quinine in some easily absorbable form. I think the insoluble, bullet-like tablets, which are found in nearly every tropical medicine chest, are responsible for many deaths every year. It is not easy to get people to believe that these things, especially the sugar-coated ones, are veritable instruments of homicide, but a convincing argument is to demonstrate them in the bed pan, and I have found that this can be done in most severe cases of fever.

In reading the histories of cases of tropical disease we continually meet with the bare statement, "the patient had been taking so many grains of quinine daily." In the absence of any information as to the form in which the drug had been administered, such a statement is distinctly misleading, as there is nothing to show whether or not there was any probability that the patient had absorbed any quinine at all.

This seems to me to be a matter of real importance. The vexed question as to the relationship between quinine and blackwater fever is a case in point.

Samarai itself affords a small contribution to the evidence showing the value of anti-malarial sanitation. It is an island, only sixty acres in extent, situated two miles from the mainland, and was formerly a most malarial little spot owing to the presence of about eighteen acres of swamp. This was treated by filling-in and draining, and the filling-in was repeated whenever necessary. For three years and a half, before I went on leave in April, 1908, I had not found an anopheles on the island or seen a case of malaria which had originated in the place in that time. While I was away there was an exceptionally heavy rainfall and some breeding places were formed, in which I found anopheles larvæ on my return. Malarial fever, both simple tertian and the irregular type, was very much in evidence among the one hundred Europeans and two hundred natives forming the population, but the filling-in was attended to at once with the result that new infections gradually became fewer and fewer. It will be a long time, however, before recurrences cease to appear among those who became infected at this time, as it seems to be impossible to make some patients continue to take quinine for the necessary length of time. If this experience shows the value of anti-mosquito work, it also indicates that, in such matters, "Eternal vigilance is the price of safety."

Sporadic cases of dysentery are occasionally met with, but bacillary dysentery occurs in epidemic waves and usually appears simultaneously at several widely separated places. In some instances, it is possible to trace a connection between the different outbreaks, but not always. Some people have indulged in meteorological, telluric and similar theories to account for these periodical outbreaks, and it seems possible that meteorological conditions may at certain times be especially favourable for the growth or increased virulence of the causative organisms, but I think it is quite likely that the element of contagion is really the important one. Natives are recruited for mining and plantation work from all over that portion of the country which is more or less under Government control, which includes most of the coast line and the eastern islands. The recruited boys are often working at places hundreds of miles from their villages, and time-expired recruits

are continually being returned to their homes. Their return is celebrated by feasting, when the natives gorge themselves on pig and other Papuan delicacies. Among the returned boys are often those who have suffered from dysentery while away, and some of these may be carriers of the Shiga bacillus, or one of the allied organisms, for the renewed activity of which the conditions are thus made favourable. This does not explain, however, why in some years one should hardly hear of a case of dysentery in the country, and here is where the meteorological theory seems to come in. The disease is very fatal among the natives who soon become convinced that evil influences are at work against which it would be futile to rebel. The village water supply is generally from creeks, which soon become infected, and in the complete absence of sanitary measures, the only hindrance to the spread of the disease is the scattered nature of the population.

Dysentery has not been epidemic in Samarai, at least not in the last seven years, although cases are frequently brought in to the native hospital, where proper precautions are taken. The water supply is derived from tanks, and with an annual rainfall of 120 inches, is abundant. All garbage is burned daily and flies are very rarely seen. At Port Moresby there have been several epidemics during that time. The water supply, also derived from tanks, is scanty, as the rainfall is only 35 inches, and there is a long dry season when flies are numerous.

A fairly clear case of infection through contaminated food occurred here recently. The hospital for venereal diseases is on a small island a mile from Samarai. The native attendant at this hospital and his wife belonged to a village some thirty miles away where dysentery was prevalent. They had not been to their village for at least six months. Some of their relatives sent them a basket of bananas, yams and other native food. This was delivered to one of my boat boys, the messenger himself not visiting the island, and was taken there in my whaleboat on my next daily visit. In a few days the attendant and his wife, and the only patient whom they had invited to share the food, all developed dysentery, and the two former died. The cases were isolated, the stools disinfected, and no further cases occurred among the forty patients in the hospital. The deaths were partly due to the fact that the attendant and his wife heard that their relatives were dying in their village, and as soon as they became sick they made up their minds that they were doomed also.

I have not seen or heard of a case of abscess of the liver in a native during the five and a half years of my service here, but I know of two cases in Europeans during that time.

Beri-beri has several times appeared amongst the natives working on the alluvial gold-fields and as carriers to and from the coast. Until two years ago these natives were being fed on rice of an inferior quality. No definite relationship was established between the rice and the disease, but there has been no beri-beri for the past two years, during which time the quality of rice imported has decidedly improved. Most of the deaths occurred on the fields where there is no medical man. The diagnosis was therefore made by laymen in these fatal cases, but a sufficient number of cases were brought to Samarai for there to be no doubt about the existence of the disease. As the Government contemplated closing the auriferous area to native labour, and the existence of the industry was thus threatened, many hygienic measures, such as the enforcement of cleanliness, some attempt at the proper disposal of sewage, disinfection of the ground by the burning of grass, etc., were instituted at about the same time as the appearance of the improved quality of rice. As these natives are only engaged for a year, the boys who were fed on the better quality of rice were also working under better general conditions than their predecessors.

Ankylostomiasis has not been found in British New Guinea, although examinations of the fæces have been made in suspicious cases, both here and at Port Moresby. This condition is quite common in North Queensland, and the Medical Officer at Friedrich Wilhelmshafen, German New Guinea, informed me that of his patients in the native hospital there, who are nearly all labourers on plantations, ninety per cent. were infected. Friedrich Wilhelmshafen is the first port in New Guinea touched at by the North German Lloyd steamers running from Hong Kong to Australia, and there are, and have been for many years, many Chinese employed on the plantations in the neighbourhood. It was thought not unlikely that the infection had been brought along this route. Chinese have not been admitted to this territory.

Elephantiasis is quite rare among Papuans. Night examinations of the blood in the Samarai native and gaol hospitals have shown, at different times, from three to six per cent. of *Filaria nocturna* infections. More than three thousand natives come under my observation every

year, and I have only seen twelve cases of elephantiasis since I have been in the country. Nearly all of these twelve cases came from one district on one of the eastern islands, although the filaria-bearers in the hospitals were from all over the eastern portion of the territory, and I have heard of occasional cases of elephantiasis at other places. The condition is quite rare compared with its incidence in some other of the Pacific Islands.

The most striking skin disease among natives, owing to its great frequency, is *Tinea imbricata*. At least fifty per cent. of the eastern natives present this condition, and it is doubtful if they consider it a disease at all. They good-humouredly tolerate our efforts to relieve it, which they believe (and not altogether without reason) are the outcome of our peculiar notions of æsthetics. A thorough scrubbing with a weak lysol solution, followed by another scrubbing with soap and water and the application of an ointment of chrysarobin and salicylic acid is usually effective. The presence of the parasitic fungus appears to cause the natives no inconvenience, even when practically the whole surface of the body from the neck downwards is covered with scales. They dress their huge mops of hair with cocoanut oil and apply this to the face also, and I have never seen the scalp or face affected.

Yaws is quite common among the natives of the mainland, and seems to be spreading among the islands, where it has hitherto been unknown. This is, doubtless, one result of the freer intercourse which has followed the extension of Government influence. It was reported last year that a terrible form of venereal disease had appeared on a large island two hundred miles from Samarai. So alarming were the statements made that the Government yacht was sent to the island in question, with an officer on board, who was instructed to bring in as many patients as he could find to the Lock hospital here. The yacht returned with twenty-six cases of yaws, twenty-four patients being adults. From the enquiries made it was evident that the disease had only recently been introduced to this island, and this is borne out by the large proportion of adults in the batch of patients secured. The routine treatment is isolation, cleanliness and the local application of sulphur ointment, with the internal administration of iodide of potassium. The sulphur ointment is used as much with a view to preventing the access of insects to the yaws, as for any beneficial effect it may have on the eruption.

I have never seen any of the ulcerative conditions of the nasopharynx which have been attributed to yaws in some places. A similar condition is met with in the Philippine Islands, where it is known as Gangosa. The etiological factor has not been determined, but it is not regarded as being connected with yaws. The *Spirochæta pertenuis* has been discovered in several cases.

It was stated in England some time ago, on the authority of a medical man who once spent a year in New Guinea, that cancer was unknown among the Papuans. At least three cases have been observed here during the last five years, and the diagnosis in these three cases has been confirmed at the Imperial Cancer Research laboratories. Another case, in which the diagnosis was made on the clinical evidence, disappeared before a specimen could be obtained. One of the cases was recently reported in the *British Medical Journal* on account of its rarity, it being a primary carcinoma of the liver in a boy of not more than sixteen. Considering the difficulties in the way of diagnosis, it is quite likely that some cases of malignant disease of internal organs are not recognised. Epithelioma certainly seems to be comparatively uncommon. Tattooing is extensively practised, and every native has scars of some kind about the body, in which keloid often develops. Not long ago I saw the most beautiful specimen of keloid I have ever encountered. A boy of about fifteen presented a well-raised purplish cuirass, completely encircling the thorax and extending, on one side, over the abdomen and below the groin, which was said to be the result of a burn received by falling in a fire some years previously.

The most rapidly fatal acute disease is pneumonia, which accounts for nearly one-third of the deaths in the native hospital. Natives suffering from pneumonia usually make up their minds, quite early in the illness, to die, and when a native reaches this frame of mind the prognosis is nearly hopeless in any condition.

Tuberculosis is quite rarely met with among Papuans, but not many of them have yet reached the stage of semi-civilisation.

Dengue fever has more than once been imported from Australia. *Culex fatigans*, which has been shown by GRAHAM, as well as by the American army officers in Manila, to be one at least of the dengue-bearing mosquitoes, is exceedingly common.

Stegomyia fasciata is also one of the commonest mosquitoes here,

and, with the opening of the Panama Canal almost in sight, assumes a position of serious importance. Why yellow fever has not been introduced to this side of the world before is difficult to explain. Although the ocean traffic direct from the home of yellow fever will be enormously increased and expedited when the Canal is open, there has been for hundreds of years no inconsiderable amount of intercourse between South and Central American ports in which yellow fever frequently occurs, and some portions of the Eastern Tropics. The *Stegomyia fasciata* is said to be a good traveller. It seems possible that something else, besides the recognised carrier and the germ, may be necessary for the disease to obtain a foothold. It is said to have been introduced into Africa many times, and yet does not seem to get any permanent hold there. In the present state of our knowledge, however, it is to be hoped that some means may be devised before the Canal is opened, by international agreement, whereby the Eastern world may be safe-guarded from the introduction of this pestilence, which would find awaiting it a non-immune population and the necessary mosquito from North China to Tasmania.

Venereal disease among the Papuans appears to be one of the results of intercourse with Europeans, and this implies that this class of disease is spreading. Four years ago the Government commenced a campaign against venereal disease, and special hospitals were established at Samarai and at one of the eastern islands, two hundred miles from here. This latter hospital was placed in charge of a Government officer, who had completed his medical course in England but failed to qualify. He reports that syphilis is quite common, and that he has seen cases of hereditary syphilis. The island on which his hospital is situated has a population of about eight thousand, and has been for generations a place where whaling and other vessels have been in the habit of calling. Things are quite different at the special hospital, Samarai, where not more than two per cent. of the patients suffer from syphilis. Gonorrhœa and soft sores, with every possible complication due to dirt, ignorance and neglect, are the everyday conditions encountered, and the fact that at least half of the eastern male Papuans have phimosis adds to the frequency of complications. That intractable condition, known as ulcerating granuloma of the pudenda, accounts for rather more than two per cent. of the cases at Samarai.

Venereal diseases are evidently new things to the eastern Papuans, for they rarely realise that they are venereal diseases at all, and they have no idea of what to do for them. For the ordinary diseases and injuries with which they are familiar they have some means of treatment, however crude and unsatisfactory these may be, but the expedients to which they have recourse in their efforts to obtain relief are often so extraordinary and harmful,—for instance, tying a string tightly round the root of the penis and leaving it there until gangrene set in, to relieve the pain of a chancroidal paraphimosis,—that they cannot have stood the test of experience.

Some few of the venereal patients come in voluntarily but most of the cases are discovered by magistrates while on patrol work and as their detection is associated, in the native mind, with crime and its punishment, there is no doubt that many cases are concealed. The special hospitals are keeping venereal diseases in check, to some extent, but it is not being eradicated and is not likely to be, especially as it is being continually reintroduced.

The influence of mind over matter is a very real thing with the Papuans. It is not uncommon for a native to die for no other reason than that he has made up his mind to do so. Several times I have seen a native, apparently unconscious and helpless, surrounded by a group of his or her sorrowing relatives who had already commenced the elaborate mourning which is customary and I have been able to find nothing to account for the condition. The application of a little liq. ammon. fort. to the nostrils has worked a startling change in the situation, but the native would have died without such treatment.

Typhoid fever has never been encountered in British New Guinea, but I have seen one case, in a European, of mild but continued fever, which appeared to be due to paratyphoid or similar infection, and I have heard of one other similar case which occurred about six years ago. In my case, it was impossible, owing to lack of facilities, to make the Widal test, but, clinically, the disease was not typhoid, even of a mild type. The patient, who was himself a medical man, had not been out of the country for some years. With the exception of these two cases, we have not, so far, met with any of those puzzling fevers of undetermined origin which are found in some places.

Quinine in Pregnancy: I usually give ten or fifteen grains of

sodium bromide with each five-grain dose of the bisulphate of quinine, as this seems to me to be a rational measure. I believe abortions are more often due to the fever than to the quinine, but in several cases in which abortions had previously occurred after the administration of the drug, I have used this combination with apparent success. Some missionaries who asked my advice on the subject, and who certainly have more opportunities of testing it on natives than I have, are quite enthusiastic about its effects. It is also useful in those very rare cases where patients suffer so much from various manifestations of nervous disturbance after quinine that they really cannot take the drug. I think most of such claims, however, have no real foundation, as in a very large proportion of them quinine can be given if the patient is unaware that he is taking it. I have met hundreds of people who said they could not take quinine, and many of them seemed to think their alleged inability to do so was a sort of moral attribute or an evidence that they were of finer clay than the common herd, but I do not think I have seen more than twenty cases in eighteen years in which the drug really caused serious symptoms.

ELECTION OF MEMBERS.

The following were duly elected as Fellows of the Society.

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ARTHUR F. COLE, M.R.C.S., Ningpo.

CAPTAIN A. E. HAMERTON, R.A.M.C., London.

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