published, and it is with this idea before us that we bring the matter forward. A publisher is ready to take the matter in hand, and it lies with the medical men themselves to state whether they desire the work to be done for them and in their interests, and whether they are ready to support by ordering a copy of the *Directory* to be sent them. There is plenty of time to get it out by 1916 if the list is returned within a week or two of being received.

There is nothing more carefully inquired into by people leaving British shores for the first time, to take up residence in any particular colony or locality, than as to the quality of the medical men they will find there. There may be only one British qualified doctor in the place, but in larger centres there may be several, and amongst these some doctor of their acquaintance at home is generally able to get to know, if he does not already know personally, something of the medical men in the place of destination of the travellers. It is a great thing for intending residents going out for the first time to have a note "to the doctor." The diseases they have heard of are so serious, and the climate reported to be so trying that the note they possess helps to bring comfort in some degree to the inexperienced facing new surroundings and dreaded climates. It is not intended that the *Directory* should confine its information to doctors with British diplomas only; others who are recognized by the "Medical Acts" of the Crown Colonies as entitled to practise there will be included as far as possible. These are generally men of foreign nationality, but possessing medical qualifications of recognized universities, &c., whether from European, American, or Indian schools, or from those of overseas British Dominions, Canada, Australia, New Zealand, &c., where recognized medical schools are met with. It is hoped also to give more space to writings and papers published by the medical men included in the *Directory* than was the case in the *Medical Directory* heretofore. Many important papers and publications were omitted from the previous directories owing, no doubt, to want of space. But seeing that much of the advancement of modern medicine is due to work of British medical men resident abroad, it is important that these should be notified at some length.

It will no doubt also be desired by many medical men who have practised their profession abroad but are now dwelling at home to have their names included in the *Directory;* this is very desirable, as doctors abroad would know where men with tropical medical experience are to be found, so that they may direct their patients where to find them. In many other ways may the *Directory* be rendered useful, such as information concerning schools of tropical medicine, &c., and we are convinced that there is a call for a directory of the kind mentioned, whether published yearly or once in two years. We hope to be able to circulate lists to fill up at an early date.

J. CANTLIE.

Abstracts.

THE DISTRIBUTION AND SPREAD OF DISEASES IN THE EAST.[1]

By ANTON BREINL, M.D.

FOR the understanding of the distribution of disease in the East, it would seem necessary to deal briefly with the origin of the earliest inhabitants of Malaysia and Oceania.

According to Hutchinson, there does not exist at present a generally accepted theory. It appears probable that the earliest inhabitants were descendants of tribes of an ill-defined Negro type, which gave rise to the Andamanese, the Semangs of Malaysia, the Aeta of the Philippines, and the Pygmies of New Guinea on the one hand, and to the Tasmanians, the Papuans, and the majority of the Melanesians on the other hand.

At a very early age the brachycephalic Mongols, called Proto-Malays by Haddon, mixed with these original inhabitants, after having migrated from the Malay Peninsula to the islands further south, giving rise to the lighter-coloured races in the Pacific.

A second early migration fused with the Proto-Malays, forming the Proto-Polynesians of Haddon, and these migrated into the western Pacific, where, mixing with the early black people, they gave rise to the Melanesians, whilst others passing through or around Melanesia, went on to Tonga and Samoa, and later to Tahiti and Raratonga, of the Cook Islands, spreading later to Hawaii and the Marquesas, and at a still later date to New Zealand.

Earlier migration still, perhaps of lowly developed Asiatic stock, may have given rise to jungle tribes of India and Ceylon, and perhaps to the Kakhyers of Northern Borneo, to the Sakai of Malaysia, and to one element in the Australian race.

These migrations, or voyages, are supposed to have begun by a migration to Java as late as 65 B.C., and did not cease till about 1350 A.D., and to them must be attributed the varied character of the population of most of the Pacific Islands.

Within the last two hundred years very little migration appears to have taken place, with the exception of the Malays, who were great fishermen, and made long journeys in their prahus in search of *bêche-de-mer*, visiting lands as far distant as the north coast of Australia.

This lack of communication may explain the fact that many of the diseases in the East are, generally speaking, confined to certain areas. Various epidemic diseases, such as cholera, plague, smallpox, &c., have spread all over the densely populated eastern countries, but have not been able to gain a firm foothold in the numerous islands of the Pacific.

The different types of malaria occur all through Tropical Malaysia and Oceania, in varying severity.

[1] Abstracted from *The Medical Journal of Australia*, June 12, 1915.

This disease is to be found as far north as the southern parts of Korea, and is very prevalent in Formosa, where the number of deaths from malaria during the years 1906 and 1908 varied between 10 per cent. and 11 per cent. of the total death-rate.

In Japan the mosquito, *Nyssorhynchus sinensis*, acts, according to Kinoshita, as the carrier of the parasite *Plasmodium vivax*, which causes the benign type of malaria, whilst *P. falciparum*, the cause of pernicious malarial fever, is transmitted by another species of mosquito, namely, *Anopheles listoni*.

Malaria is found throughout China, and some of the very worst malarial regions are to be found in tropical China, not only along the coast at Hong Kong, Canton, &c., but along the course of the rivers, where fever is just as pernicious as in the coastal districts. A severe form of malaria occurs in the Malay States, the Dutch East Indies, and most of the Pacific Islands.

In New Guinea, malaria seems to be more prevalent in the coastal districts east of Port Moresby than in the western parts, and in this region the percentage of children with enlarged and palpable spleens, a symptom which constitutes the malaria index, is very high indeed, being in many districts as much as 80 per cent. of the total number of children examined. In Western New Guinea, in the swampy, muddy parts, malaria seems only prevalent during the season when the prevailing winds are from the north-west, coincident with the presence of numberless mosquitoes, which vanish with the advent of the south-east winds.

In Tropical Australia malaria shows a fairly wide distribution. Cases have been reported from the northern parts of Western Australia and from the Northern Territory, where, in 1909, 34·10 per cent. of the total number of admissions to the Darwin Hospital suffered from fever.

The severest outbreaks of fever occurred in 1909 and 1910, during one of the mining rushes to the Territory, when the Umbrawarra Creek Tin Field was opened up. Numbers of miners had come across from New Guinea, a good many of whom were in a chronic state of pernicious malaria, and as the fever-carrying mosquito, *Nyssorhynchus annulipes*, was abundant, it spread rapidly through the mining camp, causing a number of deaths.

In Northern Queensland, sporadic cases are observed from Cape York Peninsula as far south as Townsville. In some seasons Cairns seems to be a hotbed of malaria of a virulent character, and sporadic cases have been treated at the Townsville Hospital from the scrub districts between Cairns and Townsville.

The distribution of malaria in Australia corresponds, on the whole, with the incidence of the mosquito, *N. annulipes*, which acts as the carrier of the parasite. It is curious to note that there are localities where the mosquito has been found, but where malaria is practically non-existent. An explanation of this apparent discrepancy has been put forward by Sir Ronald Ross, the great authority on malaria. According to him, the amount of malaria depends not only upon the number of suitable mosquitoes, but upon the proportion of those which succeed in biting human beings suffering from malaria, in living long enough to mature the parasite within themselves, and in again biting human beings and inoculating them with the parasite. Not long ago it was a commonly accepted idea that the female mosquito (which alone sucks blood, the male being entirely vegetarian) feeds only once, lays her eggs a few days later, and dies. But recent experience has proved that some species of malaria-carrying mosquitoes can be kept alive in captivity for as long as fifty-nine days.

According to Ross, possibly a quarter of the total number of anopheles may succeed in biting human beings once. A third of these may live for a further ten days, of which only a quarter may succeed in biting again. That is, only one out of forty-eight female mosquitoes can ever have a chance of carrying malaria.

As these figures apply only to the proportion of mosquitoes to each person, the ratio will be much smaller in thinly inhabited areas. This calculation shows that it requires a great number of suitable mosquitoes, and a number of patients harbouring parasites in their blood, for malaria to become endemic.

Dengue, another fever of very wide distribution in the East, is a fever which gives rise to the most diverse symptoms. The onset is sudden; the body temperature rises without any premonitory symptoms. The patient complains of severe pains in the head, in the lumbar regions, and in the bones; hence the popular name of "break-bone fever."

According to Ashburn and Craig's experiments, the hitherto unknown parasite of dengue fever is transmitted by *Culex fatigans*, the common house mosquito, which is ubiquitous throughout the Tropics, and it is due to the enormous prevalence of this particular mosquito that the disease has become so widely spread.

Dengue fever occurs throughout the East, assuming now and again a pandemic character. It has been observed in Formosa, Tropical China, the Philippines, the Dutch East Indies, New Guinea, and has invaded most of the islands of the Eastern Archipelago. According to records, it was introduced into Queensland as recently as 1894, probably much earlier, as I was informed that in 1879 a fever epidemic with hardly any mortality appeared in Townsville. Since then it has swept over the populated parts of Queensland and the northern parts of Western Australia into the Northern Territory. One attack of dengue fever confers only a transient immunity, and, in consequence, every now and again the whole population of the northern towns has to pay its tribute to the unwelcome guest.

The appearance of a dengue fever epidemic is always a serious matter, since it invalids the sufferer completely for about two weeks, and leaves

the convalescent patient in a singularly depressed state for weeks afterwards, so that, after a severe dengue epidemic, the number of suicides is always above the average.

Speculations as to the origin of new epidemics are fascinating. Does the dengue fever parasite lie dormant in the mosquito, its intermediary host, for months, and even years, and suddenly become again conscious of its virility when the acquired transient immunity of the populace has passed away, or is always a fresh case of the disease introduced from outside giving rise to the new epidemic? This latter conception is more likely, since one can, as a rule, see the spread starting from one centre, from street to street, and from town to town.

Malta fever, a far more serious complaint than dengue, has not yet been able to gain a firm foothold in the East. This fever comes on gradually with headaches, bone-aches, and lassitude. The patient is very ill for months, and often slight improvements and relapses follow each other at irregular intervals.

China is the only eastern country where cases of Malta fever have been known; but it is not improbable that in the near future some of the hitherto undescribed fevers will be diagnosed as Malta fever.

Bacterial Diseases.

Plague and cholera are more or less endemic in the East. The symptoms of plague are so characteristic that it cannot be mistaken for any other disease. It may appear in the form of pneumonic or bubonic plague, the former resembling, clinically, a very acute form of pneumonia, when with a sudden rise in temperature lung symptoms develop, and in the majority of cases death takes place in from thirty-six hours to three days. In the case of bubonic plague the lymph glands swell up suddenly, accompanied by a general feeling of severe malaise.

Plague is widely distributed in the East, being endemic in the southern parts of Japan, and in China, in the Malay Peninsula, and Java.

Within the last two years a fatal pandemic of pneumonic plague swept over Manchuria, causing a great mortality.

Now and again it invades the Philippine Islands, and even Australia has been visited more than once by more or less severe outbreaks of this much-dreaded disease.

In India, plague has been rampant for a long time, and it is quite a common occurrence to find 500 to 600 deaths recorded in the course of one month.

Plague is propagated by means of infected rats, and the bacilli are transmitted to a human being by the bite of the rat-fleas. According to the conclusions of the Indian Commission, the spread of plague is not so much due to the migration of rats as to the presence of infected rats on ships, and the introduction of infected fleas in merchandise. We have, therefore, in plague, a disease which might, at any time, be introduced again into Australia.

Cholera, an epidemic disease, characterized by violent gastro-intestinal symptoms and collapse, has, in all probability, originated in the East. Symptoms corresponding to this disease have been described in the most ancient Indian literature, and it was recorded in Java as far back as 1629. After an epidemic in Calcutta, which lasted till 1823, cholera began to spread eastwards to Malacca, Penang, Singapore, and Manila. In 1832-33 a pandemic appeared in Europe, United States, Cuba, and even Australia became infected, and in 1906 another severe outbreak occurred in Japan, China, and the Philippine Islands. At present, cholera is endemic in Japan, China, Malay Peninsula, Borneo, Celebes, and Java, places which are in close proximity to, and in constant communication with, the northern parts of Australia.

The possibilities of the introduction of this scourge into Australia are thus very great, and its advent can only be prevented by the strictest quarantine regulations.

Dysentery, a disease of world-wide distribution, is commonly observed in the East. The two forms, the amœbic and bacillary dysentery, the former caused by a protozoan, the latter by a number of biologically closely allied bacteria, occur endemically throughout Japan, China, the Philippine Islands, and the Dutch East Indies. Bacillary dysentery has made its appearance in New Guinea within the last two decades, and has been responsible for a great number of deaths amongst the natives. It has been spread by dysentery carriers—natives who have apparently recovered from the disease, but harbour numberless fully virulent bacteria in their intestines. Indentured labourers who have survived an attack of dysentery carry the infection to their village, thus causing, on their return, an outbreak of the epidemic. It is certainly the most important disease in New Guinea from an economic point of view.

In Northern Australia, dysentery is a comparatively rare complaint. On more than one occasion, however, it has been introduced into Thursday Island by labourers recruited from New Guinea.

Another intestinal complaint peculiar to the East, and of uncertain etiology, is sprue (tropical aphthæ), of which disease a catarrhal inflammation of the mucous membrane of the intestinal tract is the main symptom, giving rise to chronic diarrhœa. The motions are large, of greyish colour and frothy, the patient emaciates, the skin becomes dry and dark, so that the complexion of an advanced case is of an ochre colour.

Cases are found in Japan, in China, in the Philippines, Malaya, Sumatra, Java, New Caledonia, and the Fiji Islands. In Australia, the occurrence of sprue is confined to the coastal belt between Mackay and Cairns, most of the cases originating in Bowen, Ingham, and Innisfail districts. No cases, or even records of cases, have been obtained from New Guinea.

Leprosy is a common complaint throughout all tropical countries, and has not spared the East. In Japan and China leprosy is extremely prevalent, and

from olden times the disease has been rampant in these countries.

Cases are seen more or less frequently in the Philippines, Dutch East Indies, and especially in New Caledonia, where it has been introduced within the last fifty years. In New Guinea lepers are met with in small numbers along the coastal districts. A number of cases were diagnosed in the Mekeo district, west of Port Moresby, and on Trobriand Island, situated off the north-east coast. On the other hand, districts west of the Vailala River, where the oil-fields are situated, seem singularly free from the disease.

Leprosy is fortunately comparatively rare in Australia. Amongst the aboriginals in the far north lepers are found in small numbers, whilst now and again a case is discovered in a white man.

In New Zealand, in the olden times, leprosy was widely distributed, and was known under the native name "Ngerengere."

Of complaints which are most probably of purely Eastern origin, and have spread far and wide, beriberi is perhaps of the greatest economic importance.

According to Scheube, references to this disease, under the name of "Kake," occur in Chinese literature of 200 B.C., and these manuscripts contain unmistakable descriptions of beriberi. In a Chinese book, written about the tenth century, the dry and wet forms of beriberi are already differentiated, and descriptions of this disease also occur in Japanese medical literature of the ninth century. Without a doubt, however, other complaints causing dropsical conditions of the legs have been confused with true beriberi.

The most pronounced pathological lesion of beriberi is a degeneration of different nerves of the body, mainly of the nerves of the legs and the heart. It may exhibit two clinical aspects, which are differentiated into the so-called wet and dry type.

Beriberi occupies a large and anxious share of Eastern diseases. It is prevalent in Japan, Indo-China, and China. Frequent cases occur in the Philippines, in the Malay States, and in Dutch East Indies. A number of cases have been observed among the native labourers in New Guinea, whilst numerous cases originated among the coloured crews of the pearling boats in Thursday Island, filling the hospital at certain seasons of the year to its utmost capacity. A small epidemic is said to have occurred in Western Australia, and a few cases have been described from Western Queensland, whilst quite recently this disease has appeared in some of the Pacific Islands, especially Fiji and New Caledonia.

In spite of the large amount of work done on the etiology of this disease, it is still, to a certain extent, shrouded in mystery. It is a generally accepted opinion that the disease is due to deficient diet, to the exclusive use of highly polished rice; in other words, rice of which the husk has been completely removed. It is very probable, however, that even at present several different, but closely allied, diseases are classed under "beriberi."

Another disease of very wide distribution in the Eastern Tropics is yaws, or *Frambœsia tropica*. Yaws is purely a tropical disease, closely resembling syphilis in its clinical manifestations. It is accompanied by an eruption, which may attack any part of the body, and is most frequently found on the hands and soles of the feet.

Yaws is very common in India, the Malay Peninsula, in Siam, Java, and in the Philippine Islands, and throughout the Pacific Islands. In Fiji, every child is said to contract the disease in infancy. In China, cases of yaws are only rarely encountered, and then mostly in coolies returning from the Straits Settlements.

A mild form of yaws prevails in the Torres Straits Islands, where nearly every child examined had some sign of a past or present attack.

It also occurs amongst the aboriginals of the Northern Territory, and, during my visit there, I was informed that many of the aboriginal children were infected.

In New Guinea, as far as visited, the disease is rampant. A large percentage of the children in the coastal villages suffer from yaws in the different stages, and many of the adults have the curious scar formation around the mouth, the result of a past infection. Europeans, on the whole, do not contract yaws, as this disease is only propagated by contact.

Filariasis and Elephantiasis.

Filariasis is a disease caused by the presence of a nematode worm, *Filaria bancrofti*, about 4 in. in length, in the lymphatic system of human beings, giving rise to the most varied clinical symptoms, lymphangitis, abscess formation in different parts of the body, chyluria, and last, but not least, elephantiasis, an enormous swelling of the infected parts.

The worm larvæ live in the blood of the patient, and are, curious to say, in many cases, only to be found in the peripheral blood at night time. In the day time they live mostly in the lungs and in the larger vessels. The larvæ are very small, only about one-eightieth of an inch in length, and are surrounded by a sheath, in the interior of which they may be seen moving backwards and forwards.

Filariasis is a typical mosquito-borne disease. The filaria larvæ are taken up with the blood by a certain species of mosquito, in which they undergo a further development before being able to cause infection. From the stomach of the mosquito the developing larvæ emigrate to the labium, a part of the proboscis of the insect, and there they await an opportunity, when the mosquito bites again, to enter the blood-stream of man, where they develop in the course of about a year into mature adult worms.

In Japan, filariasis and elephantiasis are known to occur, but it is only the most southern part of the great island which is affected by the disease. Throughout China, filariasis is common, and it was in China where Sir Patrick Manson made his discoveries on the life-history of the parasite.

Filariasis is common in the Philippine Islands, in Guam, it is present in the Malay Settlements, in the Dutch East Indies, New Guinea, Queensland, and the Northern Territory, and it is very widely distributed in most of the Pacific Islands.

It is probable that all the filariæ of the different Eastern countries belong to one and the same species, although attention has been drawn lately to the fact that the typical nightly presence and daily absence of the parasites from the peripheral blood is not common to all the larvæ, but in some cases they are to be found whenever sought, day or night.

The Chinese microfilaria is a nocturnal filaria (from this peculiarity hails the name *Microfilaria nocturna*). The Philippine microfilaria, as well as the microfilaria in the blood of some of the New Guinea natives, is of the non-periodical type. The nocturnal filaria, however, was found to exist in New Guinea as well.

In some of the Pacific Islands, as, for example, Fiji, the non-periodical filaria exists, and *Stegomyia pseudoscutellaris* acts as intermediary host. This same species of mosquito is prevalent in Eastern New Guinea, and it is possible that the distribution of the non-periodical filaria may be coincident with the presence or absence of this species of mosquito.

In Queensland, the microfilaria show, without exception, the typical periodicity.

Filariasis is very irregularly distributed in Queensland. The disease is more prevalent in Brisbane and Port Douglas than in Townsville. In Brisbane, nearly 17 per cent. of the total admissions to the hospital show the parasite in their blood; in Townsville, however, only 3·4 per cent.

Elephantiasis occurs in all regions where filariasis is common. More than once cases were seen in New Guinea, in which the extent of the swelling was as well marked as in any of the famous text-book pictures.

Of diseases which are more or less confined only to parts of the East, Gangosa offers some interest. Gangosa, or "Rhinopharyngitis mutilans," is an ulcerative condition of the nose, palate, and throat, which begins, as a rule, as a thick, œdematous swelling on the upper lip, and spreads into the nasal cavity, to the pharynx, and often to the skin of the face and neck, destroying the greater part of the face, and giving rise to a most hideous appearance.

Cases of gangosa were first described as occurring in the Ladrone Islands, Caroline Islands, Guam, and later in the Philippines. It is endemic in British New Guinea, and numbers of cases have been observed in the coastal districts between the Fly River and Samarai. It has been found in the Torres Strait Islands, is most common in Murray Island, where it was referred to as far back as 1822 by Dr. Wilson, in his narrative of a "Voyage Round the World."

Another typical Eastern disease of limited distribution is the "Juxta-articular nodules." In the legs and arms, as a rule, in proximity to the joints, nodules are found in the subcutaneous tissue of varying sizes—sometimes as large as hens' eggs, sometimes quite small and of hard consistency. Sir William MacGregor, when Governor of New Guinea, pointed out that the nodules occur mostly on parts which come in contact with the ground when the native is resting. The frequency of their occurrence in some of the villages, their total absence in others, however, supports the opinion of a parasitic origin, which has been confirmed lately by the discovery of a fungus in the nodules.

Agchylostomiasis.

Of helminthic infections, this is perhaps of the greatest importance from an economic standpoint. In the tropical parts of China, the Philippines, throughout the Dutch East Indies, in British New Guinea, and in Northern Queensland, hook-worm is a frequent and unwelcome guest.

Agchylostomiasis may be caused by two morphologically, but closely allied, nematode worms—*Agchylostoma duodenale* and *Necator americanus*—both of which give rise to similar clinical symptoms, namely, a profound anæmia.

The first species, *Agchylostoma duodenale*, is found in China; the second species, the American hook-worm, is the more common in the Philippine Islands and in New Guinea, whilst both species are frequently encountered in Queensland.

A brief survey of the life-history of the hook-worm, which is appropriately known by the lay community under the name of bloodsucker, will demonstrate the important bearing of its presence and the danger of its further spread.

The adult female worm lives in the small intestine, and an enormous number of eggs is passed in the motions. In a hot and humid atmosphere these eggs begin to develop, and after a short interval a small embryonic worm appears. The larva leaves the egg, and grows to about one-fortieth of an inch, and moves into moist soil, or, if possible, into water, and may live there for several months.

This mature larva is awaiting now an opportunity to infect. When it comes into contact with human skin it bores its way through, enters the circulation, and passes by way of the heart into the lungs, and wanders through the trachea and œsophagus into the intestine, where the adult worm develops.

As an enormous number of eggs is passed by each infected individual, and as the sanitary conditions in the scrub leave much to be desired, it can well be imagined that in suitable localities the infection is already well established, and that unless stringent measures be taken a further spread must be expected.

It is very curious that agchylostomiasis has not been found in the Australian mines, as it is well known that the damp heat in mines is especially favourable for the development of the parasite. Experiences in other countries, such as England, Belgium, and Germany, have shown what serious consequences might arise from the employment of a few infected individuals in a suitable mine.

From this short survey of tropical diseases which occur in the Eastern countries, it becomes apparent

that there exists a continuity in the distribution of a great many of the diseases mentioned, from China, through the Malay Peninsula and the East Indies, as far as New Guinea and tropical Australia.

Tropical Australia, on account of its insular isolation and its scanty population, has enjoyed, up to now, a freedom from the inroad of many of these diseases, although quite a number of them, such as filariasis, sprue, malaria, dengue fever, yaws, and agchylostomiasis have invaded Northern Australia, and have found the conditions favourable.

Modern times, with their improved ways and means of communication, have shortened the distance between Australia and the surrounding lands, and thus have brought new and important problems before the far-seeing sanitarian.

The modern aspect of hygiene is chiefly concerned with the study of local and general conditions, which may favour the spread of disease in case it should be introduced, and at the same time with the framing and putting into practice of such quarantine regulations as will prevent their introduction.

Yellow Fever.

A practical example may give a clear idea of this conception. We are now on the eve of the opening of the Panama Canal for traffic. Ships coming from zones where yellow fever is endemic can travel without leaving tropical waters to China, India, and Australia.

Stegomyia fasciata, the yellow fever carrying mosquito, has a very long life. Female mosquitoes have been kept alive in captivity in Townsville for five months, being fed twice weekly; and it is also an expert traveller, having proved its qualities by crossing from Central America to Spain and Portugal, causing outbreaks of yellow fever on shipboard, and even in Europe.

In Europe an epidemic could not spread, since stegomyia cannot live on account of the low temperature. It is quite a different matter in the East and in Northern Australia, where stegomyia is very common. It occurs very frequently in Darwin, and as far south as Brisbane, and a few have been found in Newcastle. The temperature in Northern Australia, especially during the summer months, is high enough to enable the yellow fever parasite successfully to undergo its development in the mosquito. Suppose, as an instance, that infected stegomyia were introduced into North Queensland, and were able to infect one person. The diagnosis of yellow fever during the first three days is very difficult, even to the experienced, and it is during this time that the blood of the patient is infectious to the mosquito. Numbers of stegomyia, which occur abundantly in Queensland, would have an opportunity to take up the virus, and, after twelve days, the time required for the complete development of the parasite in the mosquito, more cases of an indefinite but fatal fever would crop up, and yellow fever would soon become established.

Let us now consider the steps which may be taken to prevent such a terrible scourge as yellow-fever from entering Australia. It is practically impossible to fumigate ships so thoroughly as to feel assured that all the mosquitoes have been destroyed. As an example of this in South America, in a zone heavily infected with yellow fever, several cases of yellow fever had occurred on one of the steamers, and the port authorities had undertaken the fumigation of the whole vessel. Just before the cabins were closed up, a wire cage containing live mosquitoes was hidden under a sheet in one of the cabins. Hours afterwards, when the ship was supposed to have been thoroughly fumigated, the majority of the mosquitoes had passed through the ordeal unharmed.

As the fumigation of ships cannot be depended upon, there is only one course open, and that is a thorough and energetic campaign against the mosquito throughout tropical Australia.

During the yellow fever outbreak in New Orleans, the Americans have proved that a town can be made practically mosquito free within a few weeks.

This question of yellow fever is discussed in some detail, because it supplies so excellent an example of the permanent danger by which we are faced.

But yellow fever is by no means the only danger to which Australia is exposed. Many diseases, grim and terrible in their manifestations, are to be found in countries which are within easy reach and in constant communication with Northern Australia. All the conditions which some of these diseases require in order to propagate when once they are introduced, such as climate and suitable insect hosts, are present, with one exception, that of a dense population. Besides human diseases, there are many deadly diseases in stock, which occur in the near neighbourhood of Australia, and which might be introduced any time, in spite of the most thorough quarantine regulations. Diseases like surra, a blood disease of horses occurring in the Philippines and India, rinderpest, and many others would cause as much havoc and mortality as did the introduction of redwater fever, which came from the East.

THE TREATMENT OF ANKYLOSTOMIASIS IN VENEZUELA.[1]

By C. E. F. Mouat-Biggs, D.T.M. & H.,
Captain, R.A.M.C.

The treatment used in many countries of Tropical America (Costa Rica, Colombia, Venezuela, &c.) is very simple, practical, harmless, and truly astonishing in its results. In Costa Rica, it is believed that it will put an end to that terrible disease, if people continue to use it in cities, villages, and farms. The treatment consists simply in taking for three consecutive days a spoonful of milk of the higueron (*Ficus laurifolia* family

[1] Abstracted from *Transactions of Society of Tropical Medicine and Hygiene*, June, 1915.

THE JOURNAL OF
Tropical Medicine and Hygiene

With which is incorporated "CLIMATE"

AND

Embodying Selections from THE COLONIAL MEDICAL REPORTS.

A BI-MONTHLY JOURNAL DEVOTED TO MEDICAL, SURGICAL AND SANITARY WORK IN THE TROPICS

VOLUME 18

JANUARY 1 TO DECEMBER 15

1915

SWETS & ZEITLINGER N.V.
AMSTERDAM - 1967