LEPROSY REVIEW.

VOL. I. NO. 2. APRIL, 1930.

EDITOR - R. G. COCHRANE, M.D.

Contents.

The Association does not accept responsibility for views expressed by the writers. Communications may be sent to the Editor, at 29, Dorset Square, London, N.W.1.

NOTES ON CONTRIBUTORS.

H. W. WADE, M.D., is Chief Pathologist to the Culion Leper Colony, and is Field Representative of the Leonard Wood Memorial for the Eradication of Leprosy.

H. P. LIE, M.D., is the Chief Medical Officer for Leprosy in Norway.

Mrs. ISABEL KERR, M.B., CH.B., is doing valuable treatment work at The Hospital for Lepers, Dichpali, Deccan, India.

N. PAVLOFF, M.D., is in charge of the Leper Colony, Vladivostock.

M. B. D. DIXEY, M.B., CH.B., D.T.M. AND H., is Secretary of the Gold Coast Branch of the Association.

MARIE WARDMANN, M.B., CH.B., is Medical Officer of the leper home at Purulia, Bihar, India.

E. LANDEMANN, L.M.P., is Leprosy Research Worker at the leper home, Purulia.

Editorial.

WE give the first place in this number to a stimulating and instructive article written by Dr. Wade, of Culion. Within the last few months the controversy regarding the best anti-leprosy measures has been revived in certain quarters. We think that Dr. Wade lays his finger on the most effective means when he says: "The Philippine system as projected, combines segregation of the infective cases, attraction of such cases by the treatment and to some extent by local rather than distant segregation, dispensary treatment of the incipient cases, and intensive survey and educational work in the field." Dr. Wade goes on to state another truth when he says: "It is realised that to extend this whole system immediately over the entire archipelago is quite impossible."

In present-day leper work there is a danger of concentrating on one scheme, and forgetting that it is only by a combination of schemes that the attack against this tenacious foe can properly be pursued. The leper must be treated at every stage of the disease; the public must learn to be afraid of leprosy, but not to shun the leper; and medical men must be efficiently trained, so that they understand the disease with which they are fighting. Then, and only then, will this age-long scourge be brought under control. When an enlightened public opinion arises in any nation, then the conditions in the country become inimical to the spread of the disease, and leprosy begins automatically to die out. We have necessarily put our weight in the balance against any measure of compulsory segregation, because we feel that this defeats its own end. On the other hand we consider that to lay emphasis on one aspect of the problem alone is equally futile. No anti-leprosy scheme is complete without the following:—

1.—Training of medical men and others in the diagnosis and treatment of the disease.
2.—The establishment of out-patient clinics in suitable areas.
3.—The establishment of leprosy hospitals and colonies which could be centres for training and research.
4.—A survey of the country or district ascertaining the type, numbers and distribution of cases.
5.—The gradual education of the public by means of propaganda, remembering that propaganda must not exceed facilities for treatment, that is, it is no

use telling people that leprosy is amenable to treatment if there are not sufficient centres to cope with the treatment of cases.

Each country has to view the problem in its own peculiar light, but the ultimate aim should be to organise a system which will reach every leper, early or late, and bring him under active treatment, preventing, where possible, infective cases passing on the disease to contacts. Until this object is attained we venture to suggest that anti-leprosy schemes are incomplete.

Evolution of the Campaign in the Philippine Islands.

H. W. WADE.

THE plan of the anti-leprosy campaign in the Philippine Islands has undergone decided change in the past few years. It has long been unusually extensive, though essentially simple. As now planned, and to some extent as it is actually in operation, it is more elaborate and differs more or less from that carried on in any other comparable region.

Systematic anti-leprosy work in the Philippines was started early in the present century. During Spanish times the only work on behalf of lepers was done by the Catholic Church, which maintained three small institutions, by nature simply refuges for those who chose to go to them. Those that were established at Manila (the San Lazaro Hospital) and Cebu have continued in use; they are the largest detention stations in the Islands, and the only places outside of Culion where as yet, under the present system a large number of lepers are being kept for any length of time.

Very early in the American regime preparations were begun for systematic work by the Government. At that time general (*i.e.*, compulsory) segregation of all known lepers who were considered infectious (because bacteriologically positive by the usual methods of examination) was the only available measure that gave any promise of success under existing conditions. It is to be realised that the general, economic and personal hygienic level of the masses was not high, and that home isolation was utterly impracticable, as it still is. It was concluded that all lepers should be isolated in a single colony.

After due investigation Culion was chosen for the projected colony. This island, one of the Calamianes group just north of Palawan, in the westernmost and one of the most isolated and least developed groups of the archipelago, was acquired at little expense. In several ways it was admirably adapted to development for the purpose. Preparatory work was started in 1901, but it was not until 1906 that enough had been done to permit taking the first shipload of lepers there. Within a very few years all that were known to the health officials were transported.

It was very unfortunate for the campaign that Culion acquired a bad reputation among the people. The segregation measure itself was naturally unpopular among those whom it was intended to benefit most, for the friends of lepers objected to giving them up, at least so long as they were not repulsive. Under the best of conditions the facts that the colony was essentially a collecting place of hopeless, afflicted people waiting to die, and was practically inaccessible to the friends of the inmates, would have created a repugnance for it. Actually the colony was for some years not well developed, and worst of all, the death rate was at first very high. Many of the patients were in bad condition because of previous neglect. The diet was faulty ; not only was the fresh vegetable element insufficient, market gardening by the inmates was not adequately developed until much later, but the effect of feeding white (" over-milled ") rice was not realised in those days, and beri-beri took heavy toll. Consequently there arose an actual horror of Culion that, though now greatly modified, has not entirely subsided in spite of the comparatively ideal conditions now existing and the generally hopeful spirit of the inmates.

When all the known lepers had been transferred to Culion it was expected that the incidence of leprosy would decline rapidly thereafter, an expectation which did not materialise. This was largely owing to the fact that the health officials failed to realise that there would be remaining a large number of hidden or undetected lepers as a result of such measures. One cannot state what the conditions would have been had not this work been commenced, but it is known that in a period of fifteen years the average number of cases segregated annually did not decline materially. On the other hand, it is not possible to surmise the result of such a system had it been carried on for a longer period without modification.

A new era commenced in 1921 when, after preliminary small-scale trials, the new treatment work was systematically

started at Culion. By the middle of 1922 it was being given to all of the more than 5,000 inmates who could take it. The Culion staff was increased until it now comprises 19 medical men (including two administrative officers and three on the pathological staff), together with three chemists, 23 nurses and various other workers. Concerning the routine and research work done at Culion and elsewhere, suffice it to say that the results obtained have had an important influence on the general campaign in the Philippines, and have made it possible to raise in the United States a special fund, the Leonard Wood Memorial for the Eradication of Leprosy, to aid in the intensification of research.

It is perhaps difficult for any who have not experienced it themselves to realise just how great is the difference that the advent of a comparatively successful treatment has made in the whole situation. Once the superior effectiveness of the new treatment was determined it became possible to modify the campaign plan and to reinforce the compulsory segregation efforts by positive attraction. It also became possible to extend the work to deal with the " incipient " cases (more accurately, those found clinically positive but bacteriologically negative), which are not subject to segregation under the law and for which, previously, nothing could be done.

When it began to be realised by the public that patients were really being cured (or, if it be preferred, " apparently cured ") and were being released in numbers the attitude toward the work began to undergo radical change. For the first time, lepers began to present themselves voluntarily. Several hundreds now come in each year. This very essential condition had previously been quite impossible of attainment. It has not been reached in all parts of the archipelago ; most of the volunteers are from the Manila and Cebu regions, but these are the ones from which the largest number of lepers come, and to which, naturally, the largest number of ex lepers have returned. With time this influence will spread.

The first important change in the campaign programme was the decision to establish, when funds could be obtained, a " regional treatment station " in each of the five or six main geographical subdivisions of the archipelago. These institutions must of necessity be built on limited areas, and be of the asylum rather than the colony type ; most of the people will live in dormitories, and the sexes will be separated. According to the plan all lepers segregated will so far as possible be kept in these stations until their response

to treatment can be determined. Those who improve satisfactorily, and who can be released in a reasonable time (two or at most three years), should never see Culion ; the others sooner or later will be sent there. In this well developed and well managed colony town, with its nearby farming areas and its extensive back-country and fishing grounds, most of the inmates do well, and their lives are remarkably free and normal, far more so than would be possible in a small leprosarium.

In part the treatment station system is intended to meet the objection of lepers to being removed from their home regions to the distant and maligned Culion colony. Other features that justify the system, are, firstly, the advantage of having those who are receiving intensive treatment under closer observation than is possible in a large colony, Secondly, the better morale that naturally exists where there are comparatively few disheartening, hopeless cases. Finally, regional stations will accelerate the infiltration of knowledge among the people of the neighbourhood around them. They will also create a hopeful and helpful attitude, and will serve as the centres for field work.

As yet this system is far from well established. The leper department of San Lazaro hospital in Manila and the old detention camp at Cebu, though both far from satisfactory, have been improved somewhat and selected patients are kept there as long as possible. A considerable number have already been released. No typical regional station as planned is as yet in operation, but the first, of 750-inmate capacity, is now being built at Cebu by The Leonard Wood Memorial, and will be occupied early in 1930. There is hope that a second one, somewhat larger, will be built near Manila in the near future. Elsewhere, however, only comparatively small institutions, more in the nature of improved detention stations, will for the present be provided. Such a development is actually under way in Iloilo, Legaspi and Zamboanga. These minor stations, imperfect and inadequate though they be, will undoubtedly become as helpful in improving the attitude of the people of these regions as the present centres at Manila and Cebu.

The second new phase of the campaign that the treatment has made possible, spoken of inclusively as field work, has most important potentialities. In part the realisation of these depends upon earnest search by the rank and file of the health personnel for " incipient " cases, and effective treatment of these in municipal clinics. Unfortunately, the immediate possibilities of this scheme seem limited.

Because of several conditions, one of them the multifarious other activities required of the health officers, most of whom work on a part-time basis, special workers are needed to cover each field, at least to get the work properly under way. This is being done in the Cebu area where a special skin clinic has been in operation for nearly two years, and a specially equipped travelling clinic will soon be in operation. Special skin clinics have recently been started in some of the other regions.

The results that are obtained at Cebu are very encouraging as to the possibilities of dispensary treatment for the comparatively easily cured incipient cases. Many, though by no means all, of the patients have taken treatment fairly regularly and to good effect, and meanwhile, they have continued their normal lives with, on the whole, fortunately little stigmatisation. This work, and the extension of it in the field through travelling clinics and other means, can, if properly conducted, be made to accelerate greatly the education of the people, otherwise a difficult matter in a population the masses of which read little, seldom see the moving picture, and do not have the radio. For a time this activity will to some extent be reinforced by field workers which the Philippine Anti-Leprosy Society is providing, primarily to survey the condition of ex-lepers. Many of these (about 2,000) have been released in recent years. Because they are not well received in their communities, they create a local new sociological and humanitarian problem. Effective as this field work might be if it were possible to carry it out on a sufficiently extensive and intensive scale, the inherent difficulties unfortunately put it, for the present at least, in the category of an important adjunct rather than a prime measure.

The Philippine system as projected, then, combines segregation of the infective cases, attraction of such cases by the treatment and to some extent by local rather than distant segregation, dispensary treatment of the incipient cases, and intensive survey and educational work in the field. Though it is realised that to extend this whole system immediately over the entire archipelago is quite impossible, the authorities believe that by doing so as rapidly as possible, or if necessary, doing the more intensive, detailed work region by region, there is much more hope than ever before of seeing leprosy eradicated, or at least reduced to comparatively unimportant proportions. The advantages of this system over any other simpler one will not be discussed here.

Work in Norway.

H. P. LIE.

THE first time that leprosy is found mentioned in Norway is in some laws about the year 1000 A.D. In all probability the disease was introduced into this country several years before that time by the Norwegian Vikings, who had brought it home from their cruises to England, Scotland and Ireland. The disease was, in previous days, spread over the whole country, but its main seat has been along the coastal districts in south-west Norway, where the town of Bergen was for many centuries a commercial town of importance, with a bustling connection with the countries to the south as well as the west.

As is the case in other countries in Europe, leprosy in Norway reached its height in the Middle Ages, round about the year 1200 A.D., and in the thirteenth century two hospitals for the treatment of leprosy were constructed in Bergen. Hospitals for lepers have been built at other places in the country, but the ones in Bergen were the most important. Here also, about the year 1410, a big new hospital, St. Jorgen's (St. George's) Hospital, was erected, which exists to this very day, and is in all probability of somewhat similar construction, although it has several times been destroyed by fire, the last time in 1702, from which time the buildings date. Of the two old hospitals, one disappeared from history about 1394, whilst the other is mentioned as a leprosy hospital as late as 1514.

As in other parts of Europe, leprosy diminished considerably in Norway in the fifteenth and sixteenth centuries, and for this reason, St. Jorgen's Hospital in Bergen was, in 1545, turned into a *general hospital*, where only a small room was reserved for a few lepers. Leprosy was now looked upon as mastered, but contrary to supposition in Norway, leprosy in the country increased, although very slowly, in the seventeenth and eighteenth centuries. Probably there was a slight decrease around the year 1800, but in the nineteenth century it made an unpleasant and rapid increase. The number of cases at St. Jorgen's Hospital, where by far the greater number were lepers, gives a good idea of the conditions. Whilst there were only 58 patients in 1720, there were 138 in 1754, 94 in 1808, and as many as 152 lepers in 1839.

A new era with regard to leprosy in Norway commenced with the year 1839. The spread of the disease aroused great

attention among private parties as well as the government. The necessity for building more hospitals was discussed, and the famous leprologist *Danielsen* commenced his scientific investigations on leprosy with support from the government. In 1847, *Danielsen* and *Boeck's* famous work " Om Spedalskhed " (On Leprosy) presented to us a lucid clinical picture which medical science had, up to this time lacked, and with their pathological, anatomical and physiological chemical researches, formed the basis of modern scientific leprosy research. The campaign against this terrible disease was now taken up from a legislative, as well as administrative point of view, and a number of new leprosy hospitals were erected. Lungegaard Hospital was built, containing 80 beds, where *Danielsen* continued his scientific investigations, and in particular tried to discover remedies for the cure of the disease. In 1857, " Pleiestiftelsen for spedalske nr. 1 " (Nursing Home for lepers, No. 1) was built, capable of taking 280 sufferers. Both of these hospitals were erected in Bergen. In 1861, the old Reknes Hospital, near Molde, dating from 1713, was enlarged so that it contained 160 beds. And the same year, the new Reitgjerdets Pleiestiftelse for spedalske (Reitgjerdets Nursing Home for Lepers) was opened near Trondhjem, in which there were 240 beds.

The reason that so many hospitals were found to be necessary was on account of the alarming manner in which the disease had spread. Thus, in 1856, there must have been at least 2,858 lepers among a population of just about one and a-half million.

In ancient times and the Middle Ages, we know that leprosy was looked upon as an infectious disease, and all to whom life and health were dear, took great care to avoid coming into contact with those suffering from this complaint. But as the disease diminished in Europe, this conception vanished little by little, and also the dread of intercourse with lepers. The general opinion held was that the disease spread hereditarily. This opinion was also supported by *Danielsen* and *Boeck*. According to their opinion, leprosy was an inheritable dyscrasia of the blood. The theory with regard to infection had always had some few supporters, and from the commencement of the last century, their numbers began to increase. In 1870 *Armauer Hansen* became a keen and prominent protogonist of the theory of contagion, and since he, in 1873, discovered the leper bacillus, this hypothesis has gained prominence, and thus formed the scientific basis for combating leprosy. As early as 1850, however, the Norwegian Government had decided on several important

sanitary measures. In 1854 they nominated a special physician, the Chief Medical Officer for Leprosy in Norway, who had to devote himself solely to the study of leprosy among the people, and to submit proposals for the combating of the disease. In 1857, so-called Boards of Health (Sundhetskommissioner) were established in the districts where leprosy was prevalent. By the Norwegian sanitary law of 1860, the task of these Boards of Health was increased to comprise not only leprosy, but all diseases and conditions which were of moment for the health of the people. These Boards of Health which exist to this very day, are organized in the following manner :

Norway is divided up into rather more than 700 small administrative districts or municipalities, which are called " Herreder." They are governed in a democratic manner, and have a well-organized self-government, which in but a comparatively few cases are restricted by government intervention. The rulers of these municipalities, the *District Corporations* (Herredstyre) in the country districts, and *Town Council* (Bystyret) in the towns, are elected from among and by the inhabitants of the towns or districts. In the country, these district corporations form the Health Board, together with the official physician, the physician acting in all cases as the President of the Board of Health. In the towns, the Health Boards consist of a number of specially elected persons, who are not in all cases members of the Town Council. In the towns, likewise, the official physician—the Town Medical Officer of Health—is in all cases the Board's President.

There is always an intimate co-operation in all questions touching leprosy, between the Boards of Health and the Chief Medical Officer for leprosy. With regard to governmental measures against leprosy, there exists a special act, namely, the act of June 6th, 1885, regarding isolation of lepers. In practice, the combating of leprosy and the control of lepers is carried out in the following manner :

In all municipalities where leprosy has existed or still persists, the President of the local Board of Health keeps an exact record of all sufferers, stating the form and outbreak of the disease, the birth-place of the sufferer, and the place or places of residence, together with the sanitary conditions of the place, conditions with regard to family and relatives, information regarding the possible cause of the disease, such as intercourse with other lepers, etc. All sufferers are examined by the President of the Board of Health at least once a year, often accompanied by the Chief Medical Officer

for leprosy, who, in the beginning of each year receives from the Presidents of the Boards of Health, a report regarding the sufferers' condition and of the sanitary conditions in their localities. If changes of importance occur in the condition of the patient, or if new or suspicious cases of leprosy appear, the President of the Board of Health concerned immediately sends a report on the matter to the Chief Medical Officer for leprosy, who, as soon as possible, makes further investigations regarding the conditions, together with the physician of the district, and draws up suggestions for the Board of Health as to what ought to be done. The Chief Medical Officer for leprosy has, as a matter of fact, only an advisory and inspecting, but not decisive authority. This always rests with the Board of Health. Injunctions on the sufferer or his surroundings are not legal and binding before they have been acknowledged by the Board of Health. At the meetings where these questions are discussed, the Chief Medical Officer for leprosy may be present if desirable, in order to supply further expert elucidation on such questions as the Board of Health might require further information about. If the Boards of Health do not take the Chief Medical Officer's advice, or if they act directly contrary to the law, the Chief Medical Officer must apply to the governmental department, to which the Boards of Health appertain, about the matter. The Chief Medical Officer stands in direct connection with, and directly under the same department. According to the aforementioned act of June 6th, 1885, poor persons suffering from leprosy must not be "laid," *i.e.*, they must not be removed from place to place for natural maintenance. Pauper lepers who are cared for by the municipality ought, as a rule, to be admitted to hospital, where the State bears all expenses with regard to nursing and maintenance. Lepers other than paupers may be instructed by the Board of Health to live in satisfactory isolation from their surroundings. With regard to the decisions of the law about isolation, exception is made in the case of married couples, who wish to live together. If, however, the Board of Health find that a leper ought to be sent to hospital, married couples may thereby be separated. The Board's decisions with regard to such a step must be submitted to the parish parson for his opinion, and thereafter receive the approbation of the Superior Magistrate (Sheriff), before legal and binding rights with regard to the leper may be used. The general rule is that the leper is removed as soon as possible to hospital. This may take place immediately, provided that the patient is willing, and in most cases he is willing, when he realizes the dangers of living at home,

and the advantages of hospital treatment. If the patient be unwilling to go to hospital, he receives a number of instructions that aim at isolating him from the surroundings in a satisfactory manner. If the sufferer, after repeated instructions from the Board of Health does not observe the precautions given him, the Board of Health may transport him to hospital against his wish with the help of the police. This method of procedure has, however, only rarely been found necessary.

In certain cases, small and specially built houses have been erected for the sufferer, so that he could continue to live at home. If a nodular case be not sent to hospital, he must have his own retreat where he sleeps and eats, have his own eating utensils, clothes and bedclothes, which must all be cleaned and washed separately. If there be any possibility that leprosy bacilli may be spread through feces or urine, such must then be disinfected with lime or similar preparation. The patient may move about in the open if he so wishes, but it is strictly forbidden to take meals or to sleep at other people's houses. In the case of anæsthetic cases, the same methods of procedure are observed as for nodular leprosy, provided that the patients are early cases, and that it might be supposed that the leprosy bacilli were excreted through the spots on the skin, or from the mucous membrane affections. In old cases without spots or affection of the mucous membrane, where one might assume that bacilli were not excreted at all, or only in a very slight degree, no compulsory removal to hospital has been employed, but the person concerned has lived by himself, and been under control in the home. The Board of Health's control is necessary, as new outbreaks of leprosy may occur after many year's standstill.

If the leper, who has had a family to support be admitted to hospital, the government has of late, granted a small sum of money annually for the support of the family, so that they should not want as long as the bread-winner lived. It goes without saying that the hospitals have at all times been ready to admit any leper, who, for one reason or another, wished to be admitted, even if he could have remained at home without being any particular danger to those around him. Such cases have also always received free maintenance in the governmental hospitals.

During transport of lepers, precautions have, as far as possible, been taken to isolate the most infectious cases, whilst in the less dangerous cases it has been considered sufficient to thoroughly clean the sleeping berth used by the patient.

When a leper has been admitted to hospital, or dies in his home, both his clothes and residence shall be disinfected in such manner as the Board of Health may consider necessary in each individual case. As a rule, the occupied room or rooms are disinfected in the same manner as that undertaken after other infectious diseases ; in some cases it has been demanded that the rooms shall be painted all over. If disinfection be neglected after leprosy, such offence is punishable.

In the leprosy hospitals, which have fairly big areas at their disposal for the patients, they may receive visits from relations and friends. The sufferers may also have a certain amount of liberty outside the hospital, but under control, especially in the case of those suffering from nodular leprosy. No leper is permitted to take a meal, or sleep outside the hospital, without special leave.

In previous days, some lepers left the hospital and went home without leave. In order to prevent this, it was decided to allow such patients as suffered greatly from nostalgia, to pay a short visit to their homes, under control. No escapes from the hospital have taken place of latter years.

From the accompanying Tables I and II, one will be able, without further explanation, to follow the course of leprosy in Norway from the year 1856 and up to the present time.

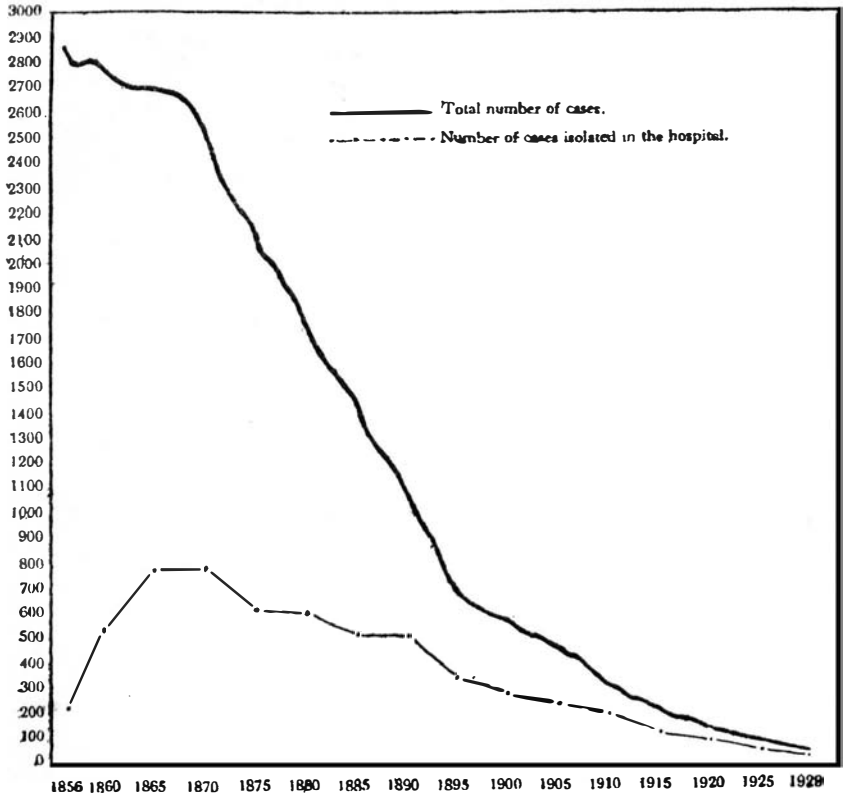
TABLE I.

FIGURES IN NORWAY.

Year.	Total Number of Cases.	Number of Cases in Hospitals.	Year.	Total Number of Cases.	Number of Cases in Hospitals.
1900	577	298	1914	261	—
1901	548	—	1915	235	146
1902	525	—	1916	216	140
1903	516	—	1917	200	129
1904	491	—	1918	188	124
1905	474	253	1919	175	114
1906	445	—	1920	160	105
1907	438	—	1921	144	96
1908	394	—	1922	136	93
1909	360	—	1923	123	87
1910	323	203	1924	114	79
1911	301	—	1925	107	72
1912	281	—	1929	74	47
1913	279	—			

TABLE II.

COURSE OF LEPROSY IN NORWAY FROM 1856 TO 1929.



As the disease has diminished so greatly and evenly, there is good hope that we are within measurable distance of seeing it disappear in Norway. We can, however, not be quite sure of its disappearance until 25 or 30 years have elapsed since the last endemic case died off, or is quite isolated. Exact investigations in latter years have proved that leprosy, at any rate in this country, may have a long incubation period, and it may also take a very long time—15, 20 and up to 27 years after the last infection, before a case comes under the notice of the Boards of Health and their control. This especially concerns the less severe cases of maculo-anæsthetic leprosy.

The Sedimentation Index: Its Value in Leprosy Treatment.

ISABEL KERR.

IT is an old adage in medicine that over a healthy muscle you will get a healthy skin. This especially holds good in a disease like leprosy. Mycobacteria lepræ cannot flourish in a healthy body. In the non-infective stage of the disease we can watch the fight between "invader and victim." And the more healthy we are able to keep the human system the more prolonged will be the fight. Mycobacteria lepræ are the organisms of low pathogenic power and cannot grow and spread unless they find suitable conditions.

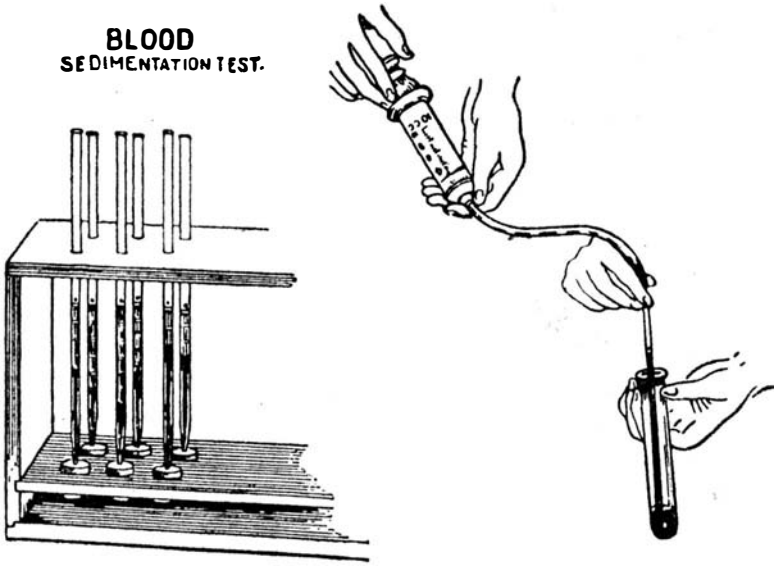
These conditions develop when for some reason the resistance is lowered. We find, for example, youths show symptoms of leprosy as they approach puberty. There is a strain put upon the system at that time, and leprous infection if present, finds its opportunity. If measures are taken to help such a patient to tide over this time by strengthening his resistance as well as by definitely dealing with the infection he will conquer; but if not, the disease will get the upper hand.

This sounds and looks very simple, and it is so in cases in the A1-B1 stage of the disease. In B1 and B2 the problem is different. Here the natural resistance of the body has broken down, and what there is left of this resistance will vary. It is this variation of resistance that determines our treatment. In undertaking treatment it will not be possible to get all the information we require by looking at the patient, though we may get some guidance by measuring his height and weight and enquiring into complications.

By checking the sedimentation rate of the erythrocytes of the blood it is possible to get a good idea of the resistance of our leprous patients. This has been fully worked out in leprosy by Dr. E. Muir, of the School of Tropical Medicine in Calcutta, who gives the technique as follows:—

> 0·3 c.c. of a 5 per cent. solution of sodium citrate in distilled water is drawn into an all-glass 2 c.c. syringe; 1·2 c.c. of blood is drawn from the patient's vein into the same syringe and, a small quantity of air having been drawn into the syringe barrel, the blood and citrate solution are thoroughly mixed by reversing the syringe several times, and the mixture is evacuated into a clean test-tube. If several patients are to be tested, their bloods are taken in a similar manner and placed in labelled test-tubes in a rack. Sedimentation is carried out in 300 m.m. pipettes graduated from above downwards from zero to 100, there being a space of 3 m.m. between each mark. The content of the pipettes when

filled up to zero is approximately 1 c.c., but a variation of 0·05 c.c. is allowed, as such a variation makes no appreciable difference in the results. The pipettes are placed upright in a rack, and their points inserted in small holes bored in rubber corks (as in illustration).



One of these pipettes is taken from the rack and its upper end is attached to a 10 c.c. syringe by means of a rubber tube. The point of the pipette is inserted in one of the test-tubes and suction being applied by pulling on the piston of the syringe, the blood-citrate mixture is drawn up into the pipette to the zero mark. The pipette is then replaced in the rack, the point again being inserted in the rubber cork which prevents the mixture escaping, and this rubber tube is then disconnected from the pipette. In this way the other pipettes are filled up to the zero mark from the other test tubes.

The top-level of the erythrocytes is read off after 1½ hours and again after 2½ hours and the average of these two readings is taken as the Sedimentation Index (hereafter called the S.I.). Thus if the level of the top of the blood-cells falls to 10 (30 m.m.) after 1½ hours and to 20 (60 m.m.) after 2½ hours, the S.I. will be the average of 10 and 20, which is 15. The maximum reading is about 80 (240 m.m.).

The simplicity of the test makes it possible to deal with a large number of bloods at the same time. The pipettes ought to stand quite straight and there should be no movement by wind from an open window, while the sodium citrate should be obtained from a reliable firm to make sure that there will be no variation in its purity.

As success in the treatment of leprosy depends on balancing the dosage of a drug with the resistance of the

patient, a knowledge of the S.I. is of great value. Medicinal reaction in leprosy is equivalent to a dose of an autogenous vaccine and by the S.I. we can gauge to a nicety the amount of vaccine generated by a drug like potass : iodide.

Patients suffering from uncomplicated nerve leprosy register a S.I. of 10 to 20 units which is the same as we find in healthy people. It is in skin leprosy that the test is most useful since by it we can not only gauge the amount of infection in the tissues but also check therapeutic changes. For example, if the mycobacteria are few and difficult to find, the S.I. will be nearly normal, perhaps as low as 22. Again, if they are plentiful such as one finds in a nodular case, the S.I. may reach 70, while between these extremes we find all sorts of variations. Also the case that registers 28 previous to a dose of a reaction-producing drug like potass : iodide may twelve hours after administration register 35 or more, thereby showing the effect of the drug. As clinical symptoms may or may not accompany this reaction, the change in the S.I. may be the only indication that the patient is reacting to potass : iodide at all.

Whatever method of treatment we adopt it is wise to take the S.I. at the commencement. If it is low, say 20 to 28, we can begin with the creosoted oil and when the patient has reached the maximum dose and shows no sign of reaction, potass : iodide can be added to the treatment provided a careful watch is kept on changes in the S.I. When a rise in the index number has been noted the reaction dose has been reached. When this is so the dose should not be increased till the S.I. remains practically unchanged before and after administration.

Should the S.I. be high, *e.g.*, 40 or more, potass : iodide should be given with extreme caution. In such cases, it is preferable to work with resistance-raising drugs like sodium hydnocarpate and hydnocarpus oil. As resistance increases the rate will fall.

In A1, B1, and B2 cases a very good idea of the resistance of patients is obtained by the S.I. In B3 cases, however, other factors come into play and we find that we can give larger doses of potass : iodide when the S.I. is high. Nephritis is the complication we have to guard against in this class of case. In my experience this has been caused not by the potass : iodide alone, but by the combined use of large doses of oil preparations to which the patients have not been accustomed.

The S.I. is very useful also in that it shows when a reaction has completely passed off. The non-reaction level and the

rapidity with which the S.I. rights itself are the real tests of resistance. It is necessary to come back to this level between each administration of potass: iodide. If this is not secured it is easy to see how one reaction is grafted on top of another and the patient is not allowed to recuperate. Experience shows that some patients need longer time between reactions than others just because of the lack of this recuperative power. If we allow reactions to follow on one another too quickly the condition of our patient will get out of hand.

The S.I. likewise shows that in complicated leprosy the disappearance of the clinical signs of reaction (temperature, erythema, etc.) is not always proof that a reaction has ceased. Here the S.I. comes in to help as it will return to the non-reaction level later than these signs.

By the S.I. we are able to detect complications. A persistently high rate, say 40 in a B1-A1, shows that there is some complicating factor we have not dealt with. Malaria, syphilis, sepsis, starvation, all raise the S.I. which will fall as soon as these complications have been eradicated.

From the above observations it should be evident that in the S.I. we have a means of controlling leprosy treatment hitherto unavailable and that there are limitations to treatment that cannot be ignored. It repays one to study the relative resistance of each patient and even if our treatment be slow, on no account should this resistance be impinged upon.

The "Medicine Men" are Interested.

The following interesting passage is quoted from a letter written by a nurse working in Tanganyika:—

> "It is the first time that any of the people in this district have ever had treatment for leprosy so it is very hopeful, and the improvement in their condition is causing great interest to the native 'medicine men.'"

The Choice of Hydnocarpus Preparation.

R. G. COCHRANE.

AS the position of potassium iodide has been discussed fully in previous numbers of LEPROSY NOTES (now LEPROSY REVIEW), I propose, in this article, to confine my attention to the derivatives of hydnocarpus oil. From time to time the question is raised by workers as to the preparation of choice among its various derivatives. It can be said at the outset that the one therapeutic fact which up to the present stands out is that there is one remedy in leprosy which so far has stood the test of time, and that is hydnocarpus (chaulmoogra) oil. In the history of the treatment of this age-long scourge many remedies have been tried, but workers have come back time and time again to this ancient medicament. It is beyond dispute, therefore, that this remedy is the most efficacious of all drugs in the treatment of the disease. One can say, then, that it is of no real moment what remedy is used in the routine treatment of leprosy, provided some derivative of hydnocarpus oil is employed. If this, then, is the case, for workers who are desiring a drug which can be used as a routine, and who have no time to experiment in discovering the fine points of difference between the remedies, their choice will depend on three factors :—

(1) The price of the drug.
(2) The convenience of obtaining it.
(3) The ease of administering it.

The cheapest of the remedies is undoubtedly pure hydnocarpus oil. The two chief drawbacks to its use are : (1) its viscosity, and, therefore, difficulty of injection ; (2) its bulk, and, therefore, difficulty of export. In addition, before use it has to be mixed with double distilled creosote to the extent of 4 per cent. of creosote in the oil, and this additional preparation means the obtaining of a pure preparation of creosote. It can be obtained, of course, all ready for injection, but the oil bought in bulk straight from its source in India, and the oil obtained ready for injection differs considerably in price.

The ethyl esters of the oil are extremely efficacious in treatment, but the question of cost is an important one. In addition, the preparation is liable, in advanced skin cases, to cause sharper reaction. It is more economical for those in institutions near the source of supply of the oil to purchase the oil and prepare their own esters. This takes a little time,

and means a small amount of additional apparatus. Therefore, because of these drawbacks, the ester preparation is not recommended for routine work.

Undoubtedly the most convenient preparation for those outside India is " Alepol." This preparation is a fine powder, and a large amount of it can be exported in a minimum space. The cost of the product comes within the scope of every institution, and all that is required is to dissolve the necessary amount of alepol (3 per cent. or 4 per cent.) in distilled water, to which 0·05 per cent. carbolic has been added. To some who are in out-of-the-way places the use of distilled water is a serious objection, but it has been found that unless distilled water is used abscesses are liable to be caused.

Although this subject has been discussed more fully elsewhere,* the writer has been asked questions regarding this subject so frequently that he considers a few more points concerning it might be of help to the many workers who are treating the disease, not as specialists, but as general workers, who have many other problems besides this to deal with.

Tetrodotoxin.

To those who wish to test out drugs for the relief of painful neuritis in lepers, we have received the following information from Dr. Wilson, of Soonchun, Korea.

Tetrodotoxin is an extract prepared from the poisonous extract of the globe fish and is very effective in some of the neuritis cases in leprosy. It does not give relief in all of such cases, and we usually try adrenalin first, and if not effective then the tetrodotoxin. One or two doses usually gives relief quite like a good dose of morphine, though it is not an opiate not does it come under the anti-narcotic law. Every leper colony should keep this on hand and give it a trial. It is manufactured by a large drug manufacturing firm in Tokyo, Japan, called Sankyo and Co.

* " Leprosy, Symptoms, Diagnosis and Prevention " (2nd Edition), Dr. R. G. Cochrane.

Leprosy in the Nose and Mouth.

N. PAVLOFF.

IN regard to the question of initial foci and the danger of spreading infection by "spraying" from the earliest times, the changes in the mucous membranes in leprosy has been a subject of discussion. A whole series of measures intended to guard against the infection of healthy persons have been instituted in various leper homes. A decree was once passed which compelled the lepers when conversing with a healthy person to cover their mouths with the hem of their garments or with their hands, and to stand against the wind. This treatment, after Sticker had proved the danger of infection by coughing or sneezing during a conversation, was shown to have been based on good grounds.

In our days no leprologist will deny the possibility of infection by the large quantities of bacilli expelled by coughing or sneezing, at the same time they will not side with those who are panic stricken at signs of leprosy in the mouth, nose or throat.

From a study of the literature on the subject, it will be seen that a considerable amount of attention has been given to the mucous membranes of the nose and the mouth, and but very little to the throat.

Falcao showed that the inflammation of the nose and bleeding from the nose are common initial signs of leprosy. Leloir, Jeanselme and Lorens remarked on the frequency of rhinitis found in the early stages of leprosy, and stated that infection of the nose not uncommonly precedes the appearance of manifestations on the skin. Morrow, Petersen, Sticker, and others believed that initial infection of leprosy is most frequent in the nose.* As a matter of fact, the nose of lepers very often shows pathological changes. This was known from ancient times, and Pliny, in describing leprosy, said: "elephantiasis a facie saepius incipientem in nare prima veluti lenticula. . . ."

The presence of bacilli in the mucous membrane of the nose in the advanced, or in the initial stages of leprosy, and with manifestations in the skin, is known to every leprologist. On this question we have sufficiently convincing evidence in the book of Sir Leonard Rogers, where statistics collected from many authors are given.

* Muir and others hold that the nose is seldom, if ever, the primary lesion in leprosy.—EDITOR.

In this paper I propose to give a morphological picture of affections met with among 200 persons and results of treatment, after painting and rinsing.

Evidently all lepers suffering from ulcers of the mucous membrane of the nose, throat and mouth are dangerous to other persons. From a prophylactic point of view it is necessary to exclude or to lessen the danger as soon as possible, and on this basis local treatment is a matter of considerable importance.

The usual clinical picture of the infection of the mucous membrane of the nose in the initial stages is the appearance of hyperæmia, erosion, infiltration (tubercles, nodules), which is often localized on the front part of the nasal septum, and owing to the swelling of the mucous membrane and the formation of crusts often brings in its train irregularity of breathing. Tubercles on the nasal septum have the appearance of grayish or grayish-yellow millet grains.

Besides the nasal septum the leprosy process infects the vomer and the mucous membrane of the cavities which are frequently acutely hypertrophied. Tubercles and nodules located in the cavities, reach a great size.

As a result, the septum which has already been changed by inflammation is destroyed.

When the alar cartilages are affected, the patients suffer from difficulty in breathing, owing to softening of the nodules. The scarring which follows brings about the complete closure of the nasal passage. Deformity of the nose, *e.g.*, depression, the transverse arching at the lower extremity of the nasal bone, " lornette de theatre," crooked or snub nose, and finally parrot's beak nose—all these are very often seen in leprosy. I have frequently observed in leper patients crooking of the septum, especially in mixed leprosy. The material investigated gives the following results :—

Changes.	L. tub. 51 cases.	L. Mixed. 96 cases.	L.mac.-an. 10 cases.	L. neural. 13 cases.
	Per cent.	Per cent.		Per cent.
Ulcers, tubercles, nodules or crusts	22	18	4 cases	15
Crooking of the nasal septum	6	15·5	1 case	18
Atrophy of the nasal cavities	—	5	—	—
Hypertrophy of the nasal cavities	31	27	2 cases	—
Perforation	41	42·5	1 case	46
Shrinking of the nasal passages	43	35	1 case	—

From the above table it will be seen that perforation of the nose and the complete destruction and hypertrophy of the nasal cavities are an important pathological process in leprosy.

For perforation in the initial stage, and for ulcers on the vomer or the lateral side of the nasal passage, I obtained encouraging results by daily rinsing with the following solution :—

Sodium chloride Borax	} ...	aa 200 pts.
Magnes. sulphate...	...	... 50 pts.

(Half teaspoonful in a glass of water.)

And painting with :—

Pot. Iod. ...	...	...	0·6 gm.
Iod. cryst....	...	...	0·2 gm.
Glycerini ...	...	...	30 c.cs.

(Paint lesions.)

Better results are obtained in limited affections by painting with a solution of 5 per cent. chromic acid or with a solution of 50 per cent. lactic acid.

I began to use a 5 per cent. solution of chromic acid from 1926, and believe that this drug very often prevents great destruction of the septum. Rinsing of the nose with the above-mentioned solution was used as a hygienic measure.

Out of 77 cases of mixed leprosy, bacilli were found in 58·7 per cent. ; 27 cases of nodular leprosy, 58 per cent. ; nerve leprosy, 36 per cent. ; and maculo anæsthetic leprosy, 40 per cent. Apparently healthy people were examined, twenty persons, who were born of leper parents, were kept under observation. They had lived with infected persons from 3 months to 21 years of age. Among them we did not find one case in which there were leper bacilli in the mucous membrane of the nose, while in one case leper bacilli were discovered in the lymphatic gland puncture—that is to say, in a patient who had been already infected by leprosy, but did not have leper bacilli in the mucous membrane of the nose.

If there are cases (Kitazato) when in a healthy person, leper bacilli have been found in the nose, then we may quote the words of Prof. V. V. Ivanoff during a speech at the Moscow Dermatological Society in 1925 : " The discovery of leper bacilli in the mucous membrane of the nose among the personnel attending leper patients, without other signs, is not sufficient to justify a diagnosis of leprosy, as in the mucous membrane of the nose there may be bacilli which are either bacilli, similar in appearance to leper bacilli, or leper bacilli which have entered the nasal region from outside by breathing, but are not virulent."

This fact to some extent denies the theory that the leprosy infection begins in the mucous membrane of the nose, and if we should take the nose as the first place of infection, then this should be done only in exceptional cases.

Leprosy infection in the mucous membrane of the mouth has a greater significance in a prophylactic sense.

Among our patients we met with tubercular or ulcerous infection in mixed leprosy (96 cases), 42·5 per cent.; nodular leprosy (51 cases), 31 per cent.; maculo-anæsthetic, out of 10 cases, only one per cent. The favourite places are the soft palate, the uvula; and the pillars of the fauces. I saw four cases out of 170 patients with tubercles on the tonsils, but I have never found ulceration.

In the initial stages the pathological process appears in the form of hyperæmia of the soft palate on which focally situated, whitish-grey tubercles of rounded form of the size of a small pea develop. Later the tubercles sink in the centre, and then they take on rounded infiltrated edges. There is a slight tendency to peripheral growth, the tubercles finally soften, ulcers are formed, and their surfaces merge and form with each other an ulcerous surface with festooned edges. Often, after the curing of the ulcers, there remain superficial cicatrices with brownish edges. Cicatrices which are localized at the base of the uvula often give sharp deformity of the arches, and the uvula inclines upwards. With considerable infection the process sometimes brings about the complete destruction of the uvula, and the cicatrices change the palatal arches to a cicatrix diaphragm which completely separates the nasa-pharynx.

Infiltrations of the hard palate are of a larger size, of a greyish-red colour, without any central depression, and chiefly break out on the surface. I have personally observed extensive erosions on the hard palate in only six cases out of 170; while on the soft palate ulcers, localized on the raphe, they were met with more frequently, and were distinguished by their large size. Usually these ulcers have sharply marked edges, an uneven base, and are covered by a dirty, greyish slough.

With the infection of the mucous membrane of the mouth the gums swell, and salivation increases, but I have so far never observed any elements on the gums and cheeks. It is otherwise with the mucous membrane of the lips. At the limit of the mucous membrane in the skin, and especially in the corners of the mouth, nodules may be seen, or more often there is an erosion of the mucous membrane with slight bleeding, and this results in incrustations being formed. Sometimes the erosions spread over the large surface of the

lips, and this is accompanied by sharp pain. Nodules also appear on the tongue, flat infiltrations, spreading transversely or longitudinally, which are for the most part on the middle line of the tongue. On the tip of the tongue and on the sides, separate tubercles are localized. We did not observe any ulcerous depressions, but glossitis sclerotica, lingua geographica, and the increase of the follicular apparatus, especially the fungiform papillæ, were met with rather often.

All these changes greatly interfere with the food assimilating functions, and in this way local treatment has a real importance.

When the infection of the mouth is considerable, disinfecting and astringent drugs and the elementary hygiene of the mouth, give little help. After many trials of different solutions and ointments, I finally decided on a 5 per cent. solution of chromic acid ; this gives very good results. Large ulcers quickly become granulated, at first flaccid, and then epithelization and scarring follows. Painting also helps when we have infiltrations. Under treatment the infiltration becomes flat, regresses, and does not ulcer. With one painting daily and rinsing, after eating, with a 2 per cent. solution of boric acid or with a 2 per cent. solution of tannic acid, the ulcers on the soft palate and uvula are usually cured in the course of two to four months.

When we have infection of the mucous membrane of the mouth, these results suggest that a 5 per cent. solution of chromic acid is a suitable and useful drug. The following illustrates this treatment. A patient was cured by preparations of chaulmoogra oil, and no ulcers appeared in the mouth. Suddenly the mucous membrane of the palate was observed to be infected, and later on large ulcers formed rather quickly. Notwithstanding the continuance of the general therapy, the ulcers were not cured. As soon as the painting with a 5 per cent. solution of chromic acid was begun, however, the ulcers quickly regressed and were cured.

We consider that chromic acid is one of the best drugs that has been tried for the cure of the leprosy process on the mucous membrane of the tongue, uvula, soft and hard palate.

As regards the infection of the arches and the tonsils, here we observed a slowing of the process of cure, but, nevertheless, chromic acid gives better results in comparison with lactic acid (painting or inhalation) and other preparations.

Work in the Gold Coast.

M. B. D. DIXEY.

THE Gold Coast lies on the Gulf of Guinea, and comprises the Gold Coast Colony in the South, Ashanti in the centre, and the Northern Territories. The area is 92,000 square miles, a little larger than Great Britain; the population is 2,300,000. A strip of Togoland held under mandate lies along the Eastern border.

The southern part of the colony consists of a dense forest belt. In this part of the colony, cocoa is grown in large quantities, and gold, diamonds and manganese are being produced; the country is being rapidly opened up by railways and roads, schools are numerous, and the natives are fast coming under the influence of civilisation.

Towards the north, however, the forest gradually becomes replaced by more open country covered with scrub, and trees are few and far between. This part of the country has not yet been developed, roads are comparatively few, and the people are still exceedingly primitive.

The Medical Service is maintained entirely by the Government. There has always been difficulty in getting Medical Officers, the majority of whom are Europeans. The tour of service is eighteen months on the Coast, followed by home furlough; therefore changes are taking place in all medical stations continually. There are no Assistant or Sub-Assistant Surgeons as in the East, though natives are trained as dispensers and nurses. Some of the Missions are carrying out medical work. The Roman Catholic Mission is doing infant welfare work in Togoland, and commencing leprosy work in the Northern territories.

Transport is by means of the railway and motor lorries during the dry season, from November till March, and the greater part of the colony can then be covered in this way. During the wet season transport may still be carried out in this way in the southern part of the colony, where the roads are of a more permanent nature; in the north, however, motor transport is then practically brought to a standstill, and everything has to be carried by natives. Horse and bullock carts, as a means of transport, are unknown owing to the ravages of the tsetse fly.

Although there are several large tribes in the Gold Coast, the most numerous and important of which are those belonging to the Akan group such as the Fantis and Ashantis, the

recent rapid development of the country has caused an intermingling of the people. As a result, it is common to hear three or four languages in every village, and in the extreme north several different dialects may be spoken in a relatively small area. An interpreter has therefore to be used, and, when trekking to any great extent, two or even three interpreters may have to be employed at one time.

The attitude of the natives themselves to leprosy is of interest. In many parts there appears to be indifference to the disease, and lepers eat, sleep, and live with others. The disease is considered to be the result of some malign supernatural influence used by an enemy. In other parts there is a little evidence to show that some method of segregation is employed. In the Northern Territories more precautions seem to be taken at the burial of a leper to guard against infection than during his life time. Lepers are rarely cast out of their homes, as is the case sometimes in the East.

Leprosy treatment has been carried out by several Medical Officers at times since the war. Dr. Helen Hendry first started a settlement in Yendi in central Togoland in 1925, and collected over fifty cases. Difficulties encountered were, however, great, owing to the very primitive state of the neighbouring natives.

Dr. Cooke, in 1926, commenced a settlement at Ho, in Southern Togoland, where the natives are more civilised. This is at present the most up-to-date settlement in the Colony, and contains over four hundred lepers.

A third settlement is at Accra, the capital.

It was decided by the Gold Coast Government in 1927, acting on the advice of the British Empire Leprosy Relief Association, to appoint a full-time Medical Officer to deal with the problem of leprosy, and during the last two years leprosy work has been proceeding along several lines, the chief of which are as follows :—

Propaganda Work.

This has been carried out among all Medical Officers, in regard to the " Diagnosis, Treatment, and Prevention of Leprosy," particular stress being laid on the importance of opening leper out-patient cliniques, on certain specified days each week, for lepers near their stations. This has resulted in the opening of eight out-patient cliniques for lepers.

Propaganda work among the population as a whole has been rather a problem, owing to the fact that the majority of the natives are illiterate. A commencement has, however, been made in larger schools.

A Leprosy Survey.

Owing to the size of the colony and the shortage of Medical Officers, this is at present only attempted in certain areas. The work is being carried out by a Medical Officer with a Travelling Dispensary, halts being made at pre-arranged places, where the natives have been notified of the intended visit. All sick persons are seen and treated. In this way the confidence of the people is gained, including the lepers. This has been found necessary, as if lepers alone are asked for, suspicions are aroused, and they hide themselves. Lepers that come forward are examined, the results being charted up. Their homes are also inspected for further cases among their relatives. Propaganda is carried out among the local Chiefs and Headmen, on the necessity of early treatment and the importance of voluntary segregation.

Treatment is given to all lepers presenting themselves, and it is interesting each day to notice the increase in the numbers of lepers coming forward.

After the departure of the Travelling Dispensary, these cases are treated as far as possible by the nearest Medical Officer.

Work in the Leper Settlements.

It is a recognised fact that it is essential in the treatment of leprosy to keep the patients occupied and happy, and as far as possible self-supporting. Leper settlements in the Gold Coast are still in their infancy, and an endeavour is being made to commence on these lines. At Ho, carpentry, masonry, wood carving, spinning and farming are being carried out, as well as the general work of the settlement, and it is hoped that similar plans in the other settlements will be carried out shortly.

Laboratory Investigations.

Concomitant infections play a prominent part in devitalising the leper, and lowering the resistance. Investigations of each patient have now been commenced in the settlements, and the lepers of the Accra settlement have been examined. Blood films are taken, the Wasserman reaction performed, the stools and nasal smears examined in each case, the results being charted up on the case cards. Treatment is then carried out on any concomitant infections that are found, and some idea is gained of the common protozoal and helminthic infections to expect. The Wasserman reaction gives an indication of the combined Yaws-syphilis rate. Moss has

shown that quite a number of these positive cases become negative, after as little as 1·8 grams of N.A.B.; if, however, the patient is suffering from syphilis a negative reaction after such a short course is unlikely. This method of differentiation between yaws and syphilis is being tried.

As leprosy work in the colony is as yet in its infancy, it is too early to make definite statements in regard to the disease, though some interesting observations are arising in the course of this work. The anæsthetic type of the disease appears to be the predominant type throughout the colony; over 80 per cent. of the known cases are of the early or late anæsthetic type. (A^1 and A^2 Muir's classification.)

Many of the patients appear to pass directly from the early to the late anæsthetic stage, without developing nodules or skin induration at all. Yaws is extremely prevalent, and in certain districts where foot yaws (clavus) is common the initial lesion appears frequently on the foot. Craw-craw is very prevalent in the Northern Territories, and is probably responsible for providing an avenue of infection in many cases. A very common site of the initial lesion in women appears to be the face. Certain cases appear to remain in the early anæsthetic stage with well-marked anæsthetic patches the greater part of their lives.

Putrescent fish is eaten universally, and the diet is badly balanced. Shortages of food occur occasionally in parts of the Northern Territories, where the population is dense, and the local rainfall variable. These factors, together with the migration to and fro during these times of want to neighbouring districts, probably tend to make the leprosy incidence higher than in the southern part of the colony. Statistics so far to hand seem to indicate the leprosy incidence to be over 7 per mille, in the Gold Coast.

Treatment.

This consists in the majority of cases of the injection of alepol, the external application of trichloracetic acid, and, when after care is possible, the use of potassium iodide. The latter has proved a difficulty with out-patients living at a distance from the Medical Officer.

Most observers in the colony who have undertaken the treatment are of the opinion that improvement occurs in the majority of cases, especially in earlier cases. Although the number discharged as bacteriologically negative is small, six at Ho, and two at Accra, nevertheless, many cases have been greatly improved and rendered non-infectious. There appears to be little doubt, however, that treatment does have an effect in

many cases in arresting the course of the disease and of rendering the chances of further complications more remote.

My thanks are due to the Honourable the Director of Medical and Sanitary Services, Gold Coast, for permission to publish this article, and for the facilities kindly given to me while carrying out leprosy work.

Grants for Leprosy Work.

The Executive Committee of The British Empire Leprosy Relief Association have recently made the following grants :—

NIGERIA.	£
Committee of the Nigeria Branch of the Association, for work in the Colony	500
BRITISH SOLOMON ISLANDS.	
Melanesian Mission, Fauabu	50

These grants have been made for the provision of buildings and simple housing accommodation for lepers undergoing regular treatment, drugs, equipment etc. Applications for financial aid will be sympathetically considered by the Committee, and all applications should, in the first place, be sent to the Director of Medical Services of the Colony concerned, who will forward them to the Secretary of the Association.

Successful Treatment in Barbados.

The following news is noted in a recent issue of "The Times" :—

> "Thirteen patients were discharged from the Leper Hospital in Barbados last year as being no longer infective."

Report on Eighteen Cases Treated with Sodium Gynocardate.

MARIE WARDMANN,
E. LANDEMANN.

Early in 1928, Sir Leonard Rogers kindly sent samples of alepol and sodium gynocardate (Martindale's " C " Fraction) to the Bankura Leper Home for trial. Dr. Cochrane, who was then in medical charge of the latter home, sent a sample of the sodium gynocardate to us for trial. Owing to the illness of one of us (E. L.), this experiment was postponed for some months. The following is a short report (tabulated) of a series of eighteen cases treated over a period of six months (shortest) to 15 months (longest) :—

Cases.	S.	I.	G.I.	S.F.	W.	D.
A1 4	0	3	1	0	0	0
B1 1	0	1	0	0	0	0
B2 4	0	4	0	0	0	0
B3 5	0	2	2	0	1	0
A2 4	0	2	0	0	2	0
18	0	12	3	0	3	0

It is interesting to compare these results with those obtained from the use of alepol, which were reported in LEPROSY NOTES, No. 5, April, 1929. The comparison is as follows :—

Cases.	S.	I.	G.I.	S.F.	W.	D.
A1 9	1	1	6	1	0	0
B1 3	1	0	2	0	0	0
B2 5	0	0	4	1	0	0
B3 7	0	0	6	0	0	1
24	2	1	18	2	0	1

S.= Stationary ; I.= Improved ; G.I.= Greatly improved ; S.F.= Sympton free ; W.= Worse ; D.= Dead.

(Although it is impossible to draw definite conclusions from so small a series of cases, it can be stated that alepol appears to have a distinct advantage over sodium gynocardate. Subsequent reports from writers on the field tend to confirm this.—EDITOR.)

Literature.

The following publications can be obtained from the Association :—

Some Questions of Empire Suffering. Report for 1928.

Leprosy, Summary of Recent Work, Nos. 16, 17 and 18. Reprints from the Leprosy Sections from the Tropical Diseases Bulletin.

Leprosy in India, Vol. I, No. 2, October, 1929. Issued quarterly by the Indian Council of the Association.

Leprosy in India, Vol. II, No. 1, January, 1930.

Leprosy, Diagnosis, Treatment and Prevention. Fourth (Revised) Edition, by Dr. E. Muir. Published by the Indian Council of the Association.

Leprosy Notes, No. 7, October, 1929.

Leprosy Review, Vol. I, No. 1, January, 1930. Issued quarterly by the Association. Price 2s.

Leprosy in Europe, the Middle and Near East and Africa—A Survey. By Dr. R. G. Cochrane. Price 2s.

Leprosy in the Far East—A Survey. By Dr. R. G. Cochrane. Price 2s.

Leprosy, Symptoms, Diagnosis, Treatment and Prevention. Second (Revised) Edition. By Dr. R. G. Cochrane. Price 2s.

The Fight Against Leprosy. Report for 1929.