LEPROSY REVIEW.

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Editorial

The visit of the Medical Secretary to three of the Colonies of British West Africa has resulted in the writing of reports on each of these. A desire has been expressed on the part of several of our readers for copies of these reports, and we have therefore embodied them in a special West African number of the Review.

The leprosy problem is many-sided. The disease itself is one, and we have no reason to believe that there are varying strains of the lepra bacillus; but the manifestations of the disease are manifold, and the predisposing causes, which fertilise the soil of the human body for the growth of the germ, or which hamper or destroy resistance to its growth, are innumerable. Also there are economic, educational, sociological and other factors which have an important bearing on the leprosy problem. All of these have to be studied if this difficult disease is to be understood and in the end effectively controlled. And it is not sufficient to study them in one country or among one race alone, for they vary in every land and in every province, among every tribe and people.

The reader of the reports which make up this number of the Review will find ample confirmation of the above statement. And yet there are certain general principles which should be kept in mind wherever anti-leprosy work is attempted. These may be summarised as follows:—

While treatment is of great value in a campaign against leprosy, the chief reliance must be laid upon prevention. Generally speaking, leprosy is easy to prevent but difficult to cure. There are many cases in which the disease is abortive. There are many others, comprising at least 50 per cent., in which under favourable general conditions complete recovery could be confidently looked for with the aid of efficient and continuous treatment. But treatment alone, while beneficial for individuals, is of limited value in the control of the disease in a community. A single unisolated highly infectious case, even if under regular and efficient treatment, may spread the disease to many contacts.

But one of the most important functions of treatment is as an aid to the prevention and control of the disease in the community. Without winning the confidence and willing

co-operation of the patient and his relatives little can be done in this direction; and it is treatment above all things that wins this confidence.

To the up-to-date public health worker who first visits a tropical village, little of practical value towards the prevention of disease may be apparent. But a careful study of tribal customs and taboos soon shows that it is most unjust and unwise to despise the ancient lore of primitive people, which at its roots is often very sound. Their observations are wonderfully accurate, though the conclusions drawn from these observations may be fallacious and needing of correction, as is shown in Section 3 of the Sierra Leone Report. There is undoubtedly among primitive peoples all over the world a peculiar dread of leprosy, recognition of the fact that it is spread by contact, and an attempt (often more or less futile it is true) to prevent this spread by means of isolation. These ideas and customs embody a tremendous latent force which the wise sanitarian will seek to understand and utilise in his preventive and public health campaign.

It has been clearly demonstrated in many countries that compulsory segregation is a two-edged weapon. When applied from without the community, it may gather in a certain number of conspicuous cases, but at the same time it drives to concealment many other infectious lepers who continue to spread disease—the more so because of the surreptitious mode of life to which they are driven.

On the other hand compulsion exercised by local public opinion, or by some local secular or religious magnate whose word is accepted as law, is a powerful force in bringing about effective isolation. There is little doubt that the action of the Church in England in the Middle Ages must have had a strong influence in stamping out leprosy. This was embodied in a funeral service, explicitly marking the leper down as dead to the whole community and forbidding him to come into direct or indirect contact with healthy people and especially with children. Here isolation was carried out by the community itself, lead by the local representative of the church.

In West Africa in many places the paramount chief has sufficient power to carry out effective segregation of lepers, and in some chiefdoms he is not only willing but anxious to exercise this power. But, whether it be chief or the medicine

man or the priest, it is the local and not an outside authority that is likely to prove successful in exercising compulsion.

Another important matter is one that we referred to in the editorial of the last issue of this journal. It is so clearly exemplified in the contrast between the most and the least efficient of the leper institutions in West Africa, that we refer to it again. Patients must be taught to realise that they are the beneficiaries and not the benefactors, otherwise there is no discipline and little good can be done.

We have already referred to the latent power embodied in the ideas and customs of primitive tribes and peoples. A vast amount of help may also be had from those who may be trained to undertake anti-leprosy work in their own villages. Young men and women suffering from comparatively mild forms of leprosy may during their few years sojourn in a leper settlement be trained in the treatment and prevention of leprosy, as well as in general public health measures. When on recovery they return to their homes their knowledge may prove invaluable in the campaign against leprosy and other diseases.

Also the school teacher often holds a strategic position in a poorly educated community. If he has been given a practical training in the nature of leprosy and how it may be controlled, he is in a position to pass on his knowledge to both pupils and parents of pupils.

It is now generally agreed that whatever steps are taken, the most important must centre round the child. Various methods of child-welfare enabling the infant to be separated from the infectious parent at birth have been discussed in the reports.

Another important matter touched on, and one that has created considerable interest among public health workers, is the utilisation of the leprosy campaign for the promotion of general public health work. In other words leprosy may be considered as a key disease. Fear is one of the most powerful of instinctive impulses; and if this impulse can be hitched to other health problems, even leprosy may be acknowledged in the end as a not unmixed evil or even as a blessing in disguise.

LEPROSY IN NIGERIA

A REPORT ON ANTI-LEPROSY WORK IN NIGERIA WITH SUGGESTIONS FOR ITS DEVELOPMENT.

I. INTRODUCTION.

IT was suggested by the British Empire Leprosy Relief Association that their Medical Secretary should visit Nigeria, and, after studying the leprosy problem and the work being done at present with regard to this disease, should offer suggestions for the further development of anti-leprosy work.

This suggestion was welcomed on behalf of the Colonial Office by Sir Thomas Stanton and by the Director of Medical and Sanitary Services. The latter kindly drew up an itinerary and made arrangements for me not only to visit existing leper settlements, and colonies, but also to study general medical and public health work throughout the country. The writer has had considerable experience of leprosy work in India, but his personal experience of Nigeria is short and inadequate. He therefore puts forward the following suggestions with some diffidence in the hope that, after discussion by those better acquainted with the administrative, political, public health and other considerations in this country, an adequate long-sighted policy may be evolved.

The writer is at issue with those who hold that leprosy can be quickly eradicated from a country like Nigeria by means either of settlements or of treatment centres. Leprosy is bound up with the presence of other accompanying and predisposing diseases, with dietary deficiences and insanitary conditions, and with ignorance and illiteracy. Till these are dealt with, leprosy is likely to remain. But this is no reason for desisting from or lessening anti-leprosy work. We shall show that leprosy may be considered a *key disease,* and that in dealing adequately with it we can open up paths towards the solution of other problems.

The leper settlement alone does not get down to the root of the problem. The aim of the suggestions embodied in this report is to evolve a policy which, however long it may take to put fully into practice, will gradually control and eventually eliminate the disease.

The natural unit for dealing with leprosy is the province, and we suggest a scheme which aims at combining and co-ordinating in united effort all the provincial forces in any way concerned.

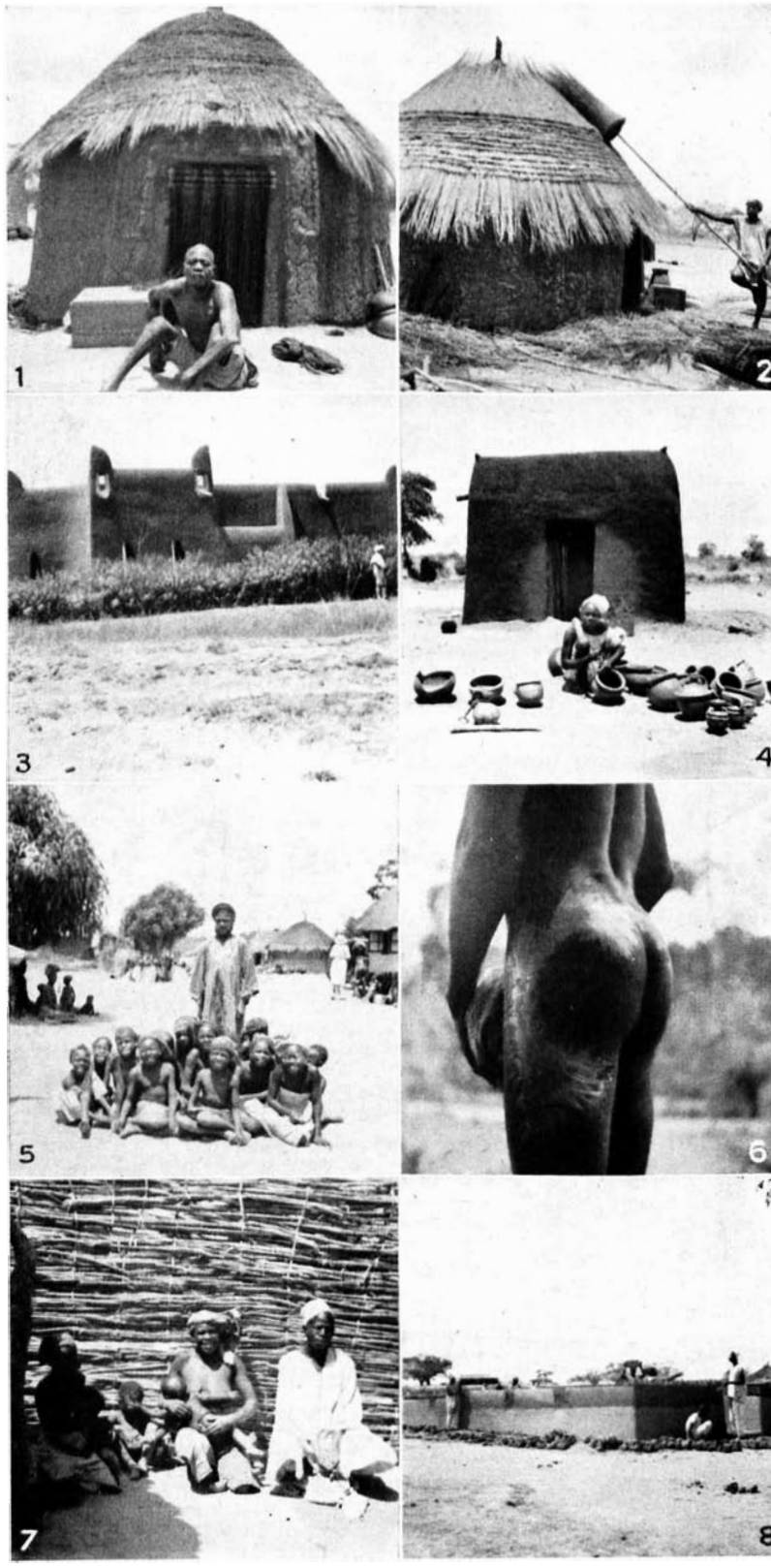
We have added a short report on the leprosy settlements visited.

II. The Leper Settlements and colonies and their respective populations are given in the last government medical Report as follows:—

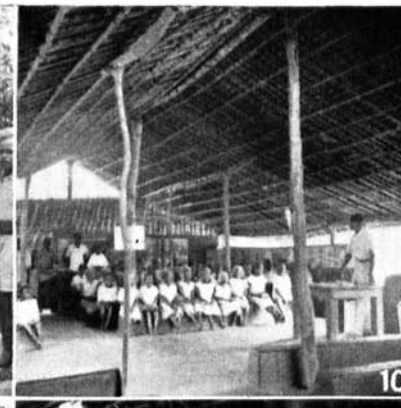
Government and Native Administration Southern Provinces and Colony.

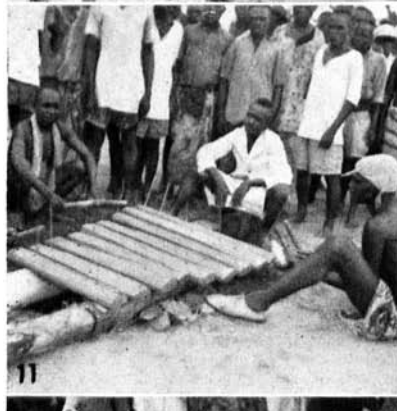
Place.	*Average Population.*
Lagos (Yaba) Colony	80
Ossiomo Farm Colony (Benin) ...	280
Uzuakoli Farm Colony (Owerri) ...	700
Onitsha Colony	105
Kumba Colony (Cameroons)	12
Bemenda Colony (Cameroons) ...	152
Abakaliki Colony (Ogoja)	62
Banso Colony	12
Northern Provinces.	
Zaria Colony	158
Ousau Colony	42
Katsina Farm Colony	278
Azare	26
Bauchi	40
Maiduguri	282
Medical Mission Colonies.	
Southern Provinces.	
Itu Farm Colony	1,500
Qua Iboe Colony	285
Ogbomosho	55
Northern Provinces.	
Garkida Farm Colony	450
Mkar	471
Vom	26
Diko	6

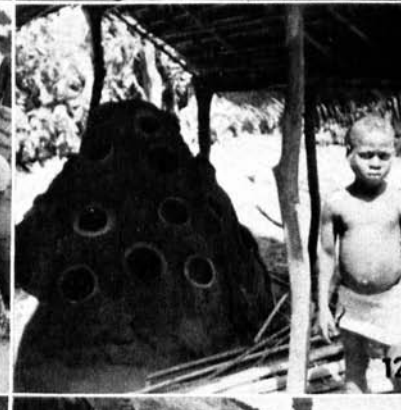
There are also the new Settlement near Kano with over 100 cases, the leper colleges near Afikpo, and small colonies connected with the hospitals at Kafanchan, Ilesha and other places. Several doctors carry on out-patient treatment of lepers at or near their general clinics. This makes a total of between 5 and 6 thousand cases in isolation. It is calculated that there are about 200,000 lepers in Nigeria, though some place the number at a higher figure. It would therefore appear that in spite of all the work and money annually expended, only one of every 35 to 40 cases is dealt with.

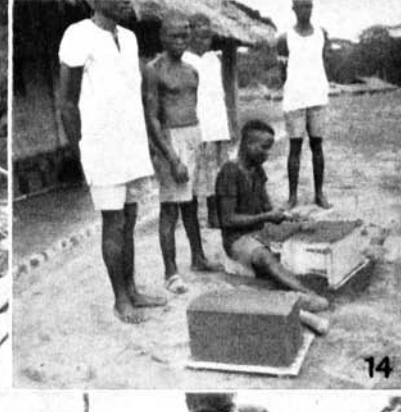


1. Hut in Leper Camp, Zaria, N. Nigeria.
2. Unrolling the thatch.
3. Mud built Hospital, N. Nigeria.
4. A leper potter, N. Nigeria.
5. Children of lepers in Zaria Camp, who should be isolated.
6. Scar after native treatment of leprosy with caustics.
7. A family in the leper camp, Katsina.
8. Lepers building a house with mud balls Katsina.









The lepers' market at the settlement.
A mahogany piano.
Leper weaver.
10. Leper children's school.
12. Juju house near the settlement.
14. Making mud blocks for building.

(9—14 are from Uzuakoli leper settlement, S. Nigeria.)

The first huts at the new Oji River settlement.
16. Clearing the bush at the same settlement.

III. TYPES OF SETTLEMENTS.

Out of some 24 leprosy institutions I was able to visit 17, omitting only the Qua Iboe and a few of the smaller settlements in the Cameroons and elsewhere. Several of the smaller settlements have been founded with the object of removing from the streets, and giving shelter to, disabled and disfigured cripples. The majority of the inmates of these institutions may be counted as ex-leprosy patients, who have formerly harboured the infection but are now no more suffering from active leprosy than a pock-marked person is suffering from small-pox. While sheltering and providing for these unfortunate people is to be highly commended as an act of charity, it is of little or no value from the public health point of view.

As an example may be mentioned the Maiduguri Settlement where, out of 240 inmates at the time of my visit, the great majority belonged this category. There were only about 50 definite cases of active leprosy, that is only about 20 per cent. In such a Settlement the whole atmosphere is influenced by the mental outlook of the majority, viz. that of dole receivers who are content to receive shelter and provision and have no desire to recover. In consequence the treatment of hopeful cases becomes exceedingly difficult. The Government Medical Officers who supervise these settlements have innumerable other duties to perform; but even if they had time to spare for the care of the lepers, they could do but little under existing conditions without entire re-organisation.

Of a totally different category are such Settlements as those at Itu, Uzuakoli, Garkida, Somaila (Kano) and Ossiomo. These are under the care of whole-time workers, and the whole atmosphere is one of activity and hopefulness. The two largest and best conducted of these Settlements are those at Itu, in the Calebar Province where there are some 1,500 lepers and at Uzuakoli in the Owerri Province, where there are some 850 lepers. But these Settlements, large as they are, and costing the Native Administrations annually a very large proportion of their total revenue, cannot deal with more than a small fraction of the total number of the infectious cases belonging to the provinces in which they are situated. Even supposing that they each isolated one quarter of the infectious cases in their respective province, (and it is questionable if they succeed in doing even this), the other three-quarters left at large would still continue to spread infection to a scarcely abated degree.

Nor can it be hoped to increase the number or the size of

such Settlements to an extent which would control at all effectively the spread of infection. The expense would be prohibitive. Some other method or methods must be sought which will supplement the efforts of these Settlements.

IV. PROVINCIAL LEPROSY UNITS.

For orderly and economical working I consider that anti-leprosy work should be organised on a provincial basis. The three parties concerned in the control of leprosy are Government, Native Administrations and Missions. Each of these can render in different capacities much service to the solution of the problem. But unless their respective efforts are co-ordinated the best results cannot be hoped for.

(1) I suggest therefore the formation in each Province of a *Leprosy Board.* Of this the Chairman should be the Resident, and the members consist of the Senior District Officer, one Government doctor in general practice in the province, one Medical Officer of Health in the province, the chairman or secretary of the Mission, the principal of one of the Institutes for Higher Education, two independent people chosen by the Resident. The Board should meet at least once a year, at the Provincial Settlement, if possible. Other meetings might be held at provincial headquarters. Minutes should be kept by the secretary who should be the Senior Medical Officer in charge of the Provincial Leper Settlement. Minutes should be forwarded, after endorsement by the Resident, to all members and to the Director of Medical Services through the Leprosy Expert, (if such is appointed).

This board would be responsible for the initiation, development and co-ordination of all anti-leprosy efforts in the province.

(2) In each province there should be a Provincial Leper Settlement which should be the principal centre for examination and treatment of patients, for training of anti-leprosy workers who would work throughout the province, and of training of workers in creches and Child-Welfare Centres. Such a settlement could not provide accommodation for more than a fraction of the lepers in the province, and its population would therefore be limited to certain types of cases, as described later. It would however form a centre of exchange for all the leprosy work of the province and would help to provide workers for Clan Settlements.

(3) As only a fraction of the lepers in each province can be accommodated in the Provincial Settlement, an endeavour should be made to form Clan Settlements. These would be

inexpensive and would provide for the majority of the lepers belonging to each Clan.

(4) In order to bring Clan Settlements into being it would be necessary to make a survey of the lepers within each clan. This work should be entrusted to Sanitary Inspectors attached to each clan. They might be assisted by ex-patients of the Provincial Leper Settlement, who had been thoroughly trained in the recognition and treatment of leprosy.

(5) In connection with the Provincial Settlements and the Clan Settlements, provision should be made as far as possible for the isolation of infants from infectious parents.

(6) With the aid of the educational authorities and other agencies the public should be educated with regard to leprosy, especially its prevention.

The above is a rough sketch of anti-leprosy work as it might be organised under the Provincial Leprosy Board. We now give in more detail suggestions for the organisation of each branch of the scheme under this Board.

V. CENTRAL PROVINCIAL SETTLEMENTS.

(1) *Nature of Settlements.* There should be one first grade leper settlement in each province where the incidence of leprosy is high.

This settlement should have accommodation for a population of between 500 and 1,000. As effective Clan Settlements (See Section VI.) are formed, the number might be diminished. There seems to be general agreement that such settlements are most efficiently and economically established and run by mission doctors, and it would be well to entrust this work, under the Leprosy Board, to one of the principal missionary societies in the province. The cost of establishment and support of the settlement should be borne by the Native Administrations in the province, each paying in proportion to the incidence of leprosy in its own area. The Native Administrations in each province should consider themselves jointly responsible for the upkeep of their Provincial Settlement. Their contributions may be supplemented by Government and other grants. Government grants might be given :—

(a) For capital expenditure for special purposes.

(b) To help in initiating colonies, money being given per head on a scale diminishing each year, as overhead costs are proportionately heavier when there are fewer patients during the first 4 or 5 years.

Patients from other provinces should be refused, and

those already admitted should be returned as soon as practicable for admission to settlements in their own provinces. In provinces in which the incidence of leprosy is less it may be more economical to have one settlement for two provinces.

(2) *Staff.* Preferably there should be two doctors on the staff, one of whom can organise preventive work throughout the province and relieve the other at headquarters during leave. Failing this, there should be a lay worker of practical ability and education who can help the doctor in part of the work. Two nursing sisters should be appointed who can organise the hospital work, train nurses and Infant Welfare workers, supervise Welfare Centres and relieve each other when on furlough. Failing two sisters there should be a second sister available from some other hospital for furlough relief and who could give part time to help in training, etc.

The subordinate staff may consist to a large extent of intelligent patients who have been trained to act as dispensers, nurses, medical assistants and laboratory workers; but there should be two or three non-leper Africans trained in laboratory work, etc.

(3) *Site of Settlement.* (a) Four or five hundred acres of good arable land with suitable soil, preferably in elevated undulating country—not excessively hot.

(b) Not on a main road but within one or two miles of a main road. Communication with all parts of the province should be as easy as possible; and yet the settlement should be far enough away from main towns and lines of communications to render easy isolation in a well-disciplined settlement.

(c) Good water supply available both for domestic use and for cultivation.

(d) Healthy site, or one capable of being rendered healthy, with special reference to Malaria, Sleeping Sickness, etc.

(4) *Types of Buildings.* (a) Good permanent buildings for staff, hospital, dispensary store, laboratory and healthy children's home, which will not require frequent expenditure on repair.

(b) Cheap huts of mud and wattle with matting or thatched roofs for patients; these can be erected by the patients themselves at a very low expenditure. Schools and other public buildings can be erected of similar materials.

(5) *Types of patients to be admitted to Settlements.* (a)

There should, especially at first, be predominently hopeful cases who come voluntarily with the object of recovery. If the majority of patients are of the disfigured and disabled type, who have no hope of or interest in recovery, then the morale of the settlement will be rendered hopeless and development on the right lines be found utterly impossible.

(b) Early cases of the abortive type, that is to say those not likely to develop the disease in an infective form, should not be retained in the settlement to the exclusion of highly infectious cases, though to begin with the treatment and recovery of the more mild forms of leprosy will render the settlement popular.

(c) The main type admitted should be the highly infectious C2 and C3 cases, who, though harbouring a high degree of infection, are capable of being rendered physically strong and healthy and are able to undertake a fair amount of work.

(d) Leprous patients suffering from other and remediable diseases from which they may be treated in the hospital and settlement.

(e) Mothers of the infectious type may be admitted before child-birth with a view to isolation of new-born children.

(f) When Clan Settlements are organised the type of patients to be admitted to the Provincial Settlement would have to be reconsidered. Patients might be admitted temporarily to the latter and undergo thorough examination and treatment for accompanying diseases. After a period of training and instruction in personal hygiene, etc., many of them could be drafted to Clan Settlements where they could continue under treatment, thus making room for the admission of fresh patients to the Provincial Settlement.

(g) A certain number of intelligent young patients in the milder stages of leprosy should be admitted not only with the object of treatment, but also that they may undergo special training in the recognition, treatment and prevention of leprosy. Those may later be of value in treatment centres, in co-operating with Sanitary Inspectors in carrying out leprosy surveys in villages and in organising Clan Settlements and carrying out treatment and Child Welfare in these when formed.

(6) *Work in the Settlement.* One of the most important factors in the treatment of leprosy is healthy physical exercise up to the capacity of the individual. Without this no other form of treatment is likely to be of permanent value. Such exercise may be obtained by communal work in the

Settlement, such as making and repairing of roads and houses, bush clearing, industries and all other activities dependent on communal life. It can also be obtained by individual farming on land either given by the Settlement or rented by the patient himself from a neighbouring landowner.

Self-support should be aimed at as far as possible. Allowances in money and kind are necessary in the majority of cases to begin with; but patients who are physically strong should try to support themselves by their own efforts. Progress towards self-support will, however, depend on sufficiency of land for agriculture, the establishment of industries on a commercial basis, the finding of suitable markets for agricultural industrial produce. In proportion as these are lacking the patients must be subsidised to a certain extent.

(7) *Treatment in Leper Settlements.* The main part of the treatment is of a general nature and varies in each individual. It is necessary therefore to study each case separately. Accompanying diseases have to be dealt with, such as venereal diseases, yaws, malaria, helminthic infections, dysentery, etc. Correction of diet is equally essential. In some cases very careful, prolonged and repeated examination is necessary before debilitating causes can be found and corrected.

It must be emphasised that mass treatment with Chaulmoogra and other special drugs is not likely to give favourable results and may in many cases do considerable harm to the patients. A well-equipped clinical laboratory is essential, and the doctor should have a well-trained laboratory assistant who is able to relieve him of a large part of the routine laboratory work. There should be one settlement in Nigeria to which laboratory assistants can be sent for training (See Section X of this Report).

(8) *Settlement Schools and Training.* As the hope of recovery depends to a large extent on the intelligent co-operation of the patient, the educational work done in a leper settlement is of great importance. Patients have to spend as a rule several years in the Settlement, and it is important that children and adolescents and a certain proportion of young adults should attend school. After learning the rudimentary subjects they can be taught to help in treatment and trained in other useful subjects, especially rural hygiene. Above all they can be trained with regard to the treatment and prevention of leprosy so that when the disease becomes arrested and they return home, they may take an active part

in the campaign against leprosy in their own villages and in Clan Settlements.

VI. CLAN SETTLEMENTS AND VILLAGE PROPAGANDA, TREATMENT AND SURVEY.

It is obvious, considering the incidence of leprosy in Nigeria, that one settlement in each province, even if it be large enough to hold 1,000 patients, cannot remove more than a fraction of the infectious cases from the general community. Supposing that one quarter of the infectious cases in any province were effectively isolated in such a Settlement (and that would be more than could be hoped for under existing conditions), the other three-quarters would continue to spread infection, and but little advance in the control of the disease could be hoped for as the result.

A policy should be aimed at which will result in the effective isolation of *all* infectious cases. As isolation of all such cases in a Central Provincial Settlement or in a number of Provincial Settlements would be impossible on account of expense, some other method must be sought.

The Clan Settlements established some years ago in the neighbourhood of Afikpo seem to point to a possible solution. A native land-owner of the Edda Clan, himself a leper, established a leper village to which other lepers of this clan were gathered. There are now five such villages within a radius of some 3 or 4 miles from a central treatment centre at Usu, which is on the main road some 10 miles west of Afikpo. Treatment is given once a week by the medical missionary from the Scottish Mission at Uburu.

The Senior Health Officer of the Southern Provinces suggests that similar leper villages might be established by Clan chiefs, land being set aside for the formation of Clan Leper Villages. I consider that this suggestion is worthy of careful consideration. In India a somewhat similar method has been adopted in the Bankura District of Bengal, by the Propaganda-Treatment-Survey method (P.T.S.).

In order to carry out any such scheme a large amount of initial propaganda would have to be undertaken and a leprosy survey would be necessary. In India we have found that treatment centres are a necessary accompaniment to effective surveys and propaganda and to the establishment of voluntary isolation of infectious cases. Compulsion, when used, must be from inside the community itself, otherwise it is apt to lead to concealment of the disease. The Native Administrations might however bring a certain amount of

influence and pressure to bear upon Clan chiefs in order to get each of them to set apart land and isolate the lepers of his clan in leper villages.

With regard to the leprosy survey which must necessarily precede isolation, and the propaganda and treatment of cases, which, as mentioned above, must accompany a successful survey, these might be gradually carried out by the Native Administration Sanitary Inspectors attached to each clan section. In this work the Sanitary Inspectors might be helped by ex-patients from the Provincial Leper Settlement, who have, as described above, been trained in the recognition and treatment of leprosy. The Sanitary Inspectors would have to be given a thorough training in the recognition of leprosy. The actual diagnosis of leprosy would be in the hands of the Medical Officer of the Provincial Leper Settlement, to whom all cases in the Sanitary Inspector's lists would be sent by the order of the Clan Chief and the District Officer. An alternative modification is suggested by the Medical Officer of the Uzuakoli Leper Settlement. " Assuming there was one Sanitary Inspector to each clan, it might be more effective to have one dispensary accessible to each group of three or four clans, in charge of a key man, who would be either an assistant of the Leper Settlement Medical Officer or a specially trained sanitary inspector, and who would co-ordinate the work in the individual clans and give treatment. Is it not likely that without this key man the individual Sanitary Inspectors would find their energies disseminated in so many directions as to neutralise their effectivity? At one end there would be the Medical Officer of Health of the Province and at the other the Medical Officer of the Provincial Settlement. The Clan Settlement Surveys would be directed by the Sanitary Inspector attached to each Clan. The link between the Medical Officer of Health and the Sanitary Inspectors would be his senior men, between the Medical Officer of the Settlement and the Sanitary Inspectors, the key man."

Necessarily the most suitable plan would vary with the circumstances in each province and with the staff available, and small local units would have to begin work on an experimental basis in order to study the best methods.

The question of remission of taxes to lepers segregating themselves effectively might be considered.

Patients who had spent a period of time in preliminary treatment and training in the Provincial Settlements could be sent on to the Clan Settlements. Clan Settlements would require a certain amount of supervision, and should be visited

as often as possible by a Medical Officer of the Provincial Settlement.

A further suggestion is that each Provincial Settlement should be divided into two sections, one for infectious and the other for non-infectious cases. All healthy children living in the settlement should be strictly confined to the latter.

VII. INFANT WELFARE WORK.

There is general agreement among leprosy workers that the care of children and their isolation from infection is one of the most important items in the campaign against leprosy. Young children are particularly susceptible to the disease. Also those infected in early childhood tend to develop a more severe and infectious form of the disease than those infected in adult life; they therefore are chiefly responsible for spreading the disease to the next generation.

Leprosy is due to post-natal infection. Therefore children separated at birth from infectious parents, and kept free from infection, do not develop the disease. The best method of bringing up children thus separated from their mothers is a matter for discussion. At Itu Settlement the infants are kept apart from their mothers except at feeding time when special precautions are taken to prevent contact except between the child's mouth and the mother's nipple. At the Uzuakoli Settlement the children are artificially fed and do not come in contact with the mothers at all. This latter method, which at Uzuakoli has so far given uniformly satisfactory results, appears to be the safer of the two; though I do not think there is much danger of women infecting their children if repeated examinations have shown that they are bacteriologically negative.

There is also the question of the health of the mother, as the strain of suckling often weakens the mother and leads to an increase of leprous symptoms. Also skilled artificial feeding may be better for the child in some cases than the milk of a leprous mother.

Creches situated at the Provincial Settlements might be used as training centres for child-welfare workers chosen from among uninfectious girl lepers. These might perhaps later be used to conduct similar creches in connection with Clan Settlements and situated in the non-infectious section (See the last paragraph of Section VI).

VIII. CO-OPERATION OF EDUCATIONAL AUTHORITIES.

Leprosy is a disease which though difficult to cure, is easy to prevent.

superstition, crowding and insanitary conditions. Education of school children in public health and sanitation may include practical teaching regarding leprosy and its prevention. It is important that all school teachers should be given practical training in this latter subject and be taught to recognise leprosy and the means that are necessary to prevent its spread. They should be supplied by the educational authorities with a practical well-illustrated guide dealing with this subject, and their training should include practical demonstrations by a leprosy expert. A teacher thus prepared may then help in organising anti-leprosy measures in the village where his school is situated. I have met with considerable sympathy and promises of co-operation from educational authorities and principals of training institutes throughout Nigeria.

IX. LEPROSY AS A KEY DISEASE.

Anyone acquainted with the many diseases and public health and other problems of Nigeria, on reading the above suggestions will probably consider that the expenditure necessary to carry out this programme will be out of proportion to its importance relative to these other problems.

There is much truth in this criticism. Leprosy is not a fatal disease. Its mortality as compared with that of Malaria, Sleeping Sickness and many other diseases is negligible. But leprosy though not fatal probably causes during its long course more distress, physical and mental, than any other disease.

On the other hand, leprosy, if attacked along the lines suggested above, may be considered as a key disease which will open the way towards the solution of other public health problems.

The more intelligent young men trained in provincial settlements in sanitation, and the recognition, treatment and prevention of leprosy, may be found useful in introducing sanitary measures when they return to their own villages. Similarly young women trained in child welfare work may find scope in the villages. Action taken by clans to control leprosy may open the way to controlling other diseases.

The general dread in which leprosy is held is a driving force which when wisely directed may be used to bring about not only particular but also general village sanitary reforms.

X. TRAINING OF WORKERS AND SUPPLY OF DRUGS AND APPARATUS.

I found that in many settlements satisfactory laboratory

work was not carried out. Cases in which there were not even distinct sensory changes were sometimes diagnosed as leprosy without bacteriological examination. I found that syphilis and yaws are diagnosed in the settlements without the aid of seriological tests, and I suspect that signs attributed to leprosy are sometimes really due to yaws and syphilis. In India the Kahn test is widely used in leper settlements and clinics, and it is found to be fairly accurate even in the hands of dispensers who have been carefully trained.

In the various leper settlements I found various preparations of hydnocarpus oil in use. In some, expensive preparations such as moogrol are used; in others, esters prepared at Yaba are used. At Uzuakoli and Itu the esters are prepared locally from oil imported from India. In others the oil itself is used. In my own experience in India I have found the oil with 4% creosote, and the esters with 4% creosote equally effective. The latter has the great advantage of being very cheap. Its disadvantage is its greater viscosity and the consequent difficulty of injection. But, if it is heated to about 50°C at the time of injection, this disadvantage is overcome.

I found that injections were given chiefly intramuscularly and subcutaneously; but often with very little skill. I consider that the intradermal or plancha method is the most suitable in a large proportion of cases; and I found that this method is attempted in many settlements, but, as the technique had not been mastered, bad results are obtained. I demonstrated this method in several settlements using cresoted oil for this purpose.

In some settlements Alepol solution is used. But there is a general consensus of opinion that this preparation is not as effective as the oil or esters. In some places bad results were obtained with Alepol, and in one settlement several fatalities occurred with it due to lack of adequate supervision of insufficiently trained African workers.

The treatment of leprosy requires considerable skill. While in settlements with whole-time doctors treatment is carried out by the very best possible methods, in others, where the doctor can only spare a limited amount of time and the treatment is conducted by inadequately trained assistants, the methods and results are far from satisfactory.

Until hydnocarpus oil of Nigerian manufacture is available, it would be well to lay in sufficient stores from India to supply oil and esters to all the leprosy institutions in the country with the exception of those that prefer to order their own oil direct. Esters might be manufactured as at

present. I understand that only a limited amount of this can be manufactured at present; but this might be sent out to settlements asking for it in preference to the oil. I would suggest:—

(1) That all oil and esters be made up in bottles which are nearly full, as otherwise these preparations come in close contact with air and deteriorate more rapidly.

(2) That four per cent. creosote be added to both oil and esters and that both preparations be sterilised before being sent out, the creosoting and sterilising being clearly indicated on the label.

I think it would be well to have in stock Kahn test and Sedimentation Test apparatus. The standard form of the latter used in leper institutes in India might be ordered through the Leprosy Research Department at the School of Tropical Medicine, Calcutta. This would ensure uniformity of results with those using the test in India. These could be supplied to Nigerian leper settlements at cost price as required.

Various stains and other apparatus necessary for leprosy settlement laboratories might also be held in stock to facilitate the supply to those requiring them.

I think it would be well to have one leper settlement in Nigeria specially equipped for training. It would have a well-equipped laboratory where bacteriological examination methods, faeces, blood and urine examination, and various tests, such as the Kahn, sedimentation, leprolin, &c. are carried out. There would also be demonstration of the preparation and administration of drugs by the latest and most approved methods.

I consider it important that the doctor in charge of this training settlement should be deputed to India for an intensive course of training for 5 or 6 months. There he would study in Calcutta and other centres where research and field investigations have been conducted for some years. The Training Settlement would then form a centre of training both for doctors in charge of settlements and for African assistants. It might be well also for doctors who are not specialising in leprosy to pay visits to such a centre and acquaint themselves with this disease which is so prevalent throughout Nigeria, and enters to a certain extent into the work of every doctor.

XI. LEPROSY EXPERT FOR NIGERIA.

(1) If the above programme for dealing with leprosy is adopted in its broad outlines, considerable experimental work will have to be done and experience gathered before it can

be carried into practice; the more so as details will necessarily vary in different provinces and especially between the north and the south. These preliminary investigations would be considerably facilitated by the services of a suitable leprosy expert who would study leprosy in the different areas.

(2) Moreover in each Provincial Unit the co-operation of various agencies is essential especially of government and mission authorities. Both missionaries and government officials have repeatedly told me that co-operation between Government and missions and between the various missions, is not what it should be or what they would desire it to be. This lack of co-operation is due in large measure to viewing the same problem from different points of view. It could, I consider, be overcome by frank discussion; and one of the important results of Provincial Leprosy Boards should be to make possible and easy such co-operation. The appointment of a suitable leprosy expert who would be in close touch with Government officials, and at the same time with missionaries, as well as with Native Administrations, Sanitary Inspectors, etc., would also help considerably in this direction.

(3) A third benefit from a leprosy expert would be that he would be necessarily a man of wide experience, who had studied its various aspects. He would be free from routine work, would be able to spend some months in each province studying local conditions, initiating work, training Sanitary Inspectors, teachers and others who are in a position to help in the anti-leprosy campaign. The medical officers in charge of Provincial Settlements are themselves experts in leprosy, but they are to a large extent tied down by routine work, and their opportunity of studying the disease elsewhere is limited. The Nigerian Leprosy Expert would be able to help them considerably from his wider experience. He would be able to initiate and extend work in each province and stimulate effort, especially in those provinces in which little has so far been done.

(4) The Nigerian Leprosy Expert would necessarily be a man who had studied leprosy in other countries. He would be a man of ability and tact and one able to command the respect and co-operation both of Government officials and of Missionaries. He should be appointed *ad hoc,* and preferably be considered as the agent of the British Empire Leprosy Relief Association and its Nigerian Branch. His salary might be paid by or through that Association and its Nigerian Branch. The appointment might in the first place be for

five years, to be continued if thought suitable after that period.

Technical Expert. As farming and various industries form a very important part of leper settlement development, I consider that there is need for a technical expert who would not be permanently attached to any one settlement but would spend some months at each settlement in turn and initiate and develop farming, industries &c. His experience gathered in each settlement he visits would be of use to all. He could be of special value in initiating hydnocarpus oil production and other industries requiring special skill, and could help and advise regarding buildings, latrines, water supply &c.

Perhaps the British Empire Leprosy Relief Association —Toc H Committee, might consider the appointment of such an expert.

XII. LOCAL HYDNOCARPUS (CHAULMOOGRA) OIL PRODUCTION.

I visited the Sapoba Forestry Plantation of Hydnocarpus Wightiana trees, and discussed the possibilities of developing and utilising this plantation, both with Mr. Ross at Sapoba and later at Ibadan with Mr. Weir, the Chief Conservator of Forests.

The plantation is as follows:—

1927	2	400
1931-32	4.2	840
1935	7	1400
1936	10	2000
	23.2	4640

A certain proportion of the trees are males and will give no yield. But I think we may count on some 2000 trees being ultimately available from this plantation. The present yield of seeds from the 1927 trees is about 2 lbs. a tree, but this should increase as the trees grow larger. Some of the larger trees in South India yield many hundredweights of seeds. By cold extraction oil 1/3 the weight of the seed can be extracted. This oil is suitable for treatment of leprosy by injection. A further 1/6th of the weight of the seed could be extracted later by heating, this oil being used for inunction.

The growth of hydnocarpus trees and the extraction of oil might form a very useful industry at one or more of the leper colonies. Both Mr. Ross and Mr. Weir welcome the establishment of such an industry, and Mr. Ross has offered

to supply seedlings and to report on the suitability of land at one or more of the colonies for the growth of the trees. About 1,000 seedlings are at present available, which, planted at 200 trees per acre, 15 ft. apart, would be sufficient in the present year for 5 acres. The Ossiomo Settlement is the nearest to Sapoba and the Oji River Settlement, Usuakoli and Itu settlements are also possibilities. The months for planting are June and July, so that, if leper settlements plantations are to be begun on an experimental basis this year, arrangements will have to be made without delay. Both Ossiomo and Oji River settlements have expressed their desire to have such plantations formed on an experimental basis. A suitable press would have to be installed, and perhaps a government grant for this purpose might be made. If the press could be installed at the Ossiomo Settlement, about 50 miles from Sapoba, or at Oji River Settlement, about 120 miles from Sapoba, the seeds from the present yielding trees at Sapoba might be sent there for extraction. Information regarding the most suitable press and the method of extraction might be obtained through the Surgeon-General, Madras, from the Chemist at the Government Stores Depot, Madras, India, where the supply for the Madras Presidency and other parts of India is prepared.

An alternative would be to increase the plantation at Sapoba and send the seeds to Yaba, where esters of hydnocarpus oil are at present prepared. But I consider that possibly this industry could ultimately be more cheaply and favourably carried on at a leper settlement, and would afford employment to the lepers themselves. The oil could then be distributed to the various leper settlements and treatment centres.

XII. ACKNOWLEDGMENTS.

I wish to acknowledge with thanks the help of the Director of Medical and Sanitary Services in so carefully planning my itinerary, in making arrangements for my journey throughout the country and in helping me in innumerable other ways. The Residents, District Officers, Medical Officers, Forestry Officers and other Government Officials, by their hospitality and the time and assistance they gave unsparingly, helped to make my tour a success. I wish to thank them and also the missionaries who also gave me considerable help. Unfortunately the Medical Officers in charge of the Itu and Somaila Settlements were absent on leave. I received considerable help in framing the above scheme from the Senior Medical Officer of Health of the Southern Provinces and the Medical Superintendent of the Uzuakoli Settlement, who deserve my special thanks.

LEPER INSTITUTIONS IN NIGERIA

REPORT OF VISITS BY THE MEDICAL SECRETARY OF THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION.

1. *Yaba Leper Colony, Lagos.* Visited on 3rd April, 1936. There were 80 inmates, the great majority of which were males. Two or three appeared to have been admitted for diseases other than leprosy. Many of the patients appeared to have only slight signs of leprosy and only about one-third of the men appeared to be seriously infectious cases, though others may have been slightly infectious. women seemed to be chiefly of the secondary neural type with marked deformities. I gained the impression that most of the patients had improved since admission chiefly due to the better food and the hygienic conditions in which they were living. Many of the patients seem to have come from distant provinces. The camp is visited by an African doctor and supervised by the Medical Officer of the African Hospital at Lagos.

2. *Zaria Leper Camp.* Visited on 8th April, 1936. This camp was surveyed by Dr. Howard in February, 1935. He found 39 neural, 13 cutaneous and 43 mixed cases. Of 25 children born in the camp, 4 showed suspicious patches, all of which were found bacteriologically negative at that time. Acid-fast bacilli were found in a nasal smear from one child with clinical signs. Treatment of the men is carried on by a Dogari appointed by the Native Administration, who gets 25/- a month. Treatment to the women is given by a nursing sister from the C.M.S. hospital. There are 106 huts. The sanitation of the camp is good. There is good farming land between the camp and a river which is half a mile distant.

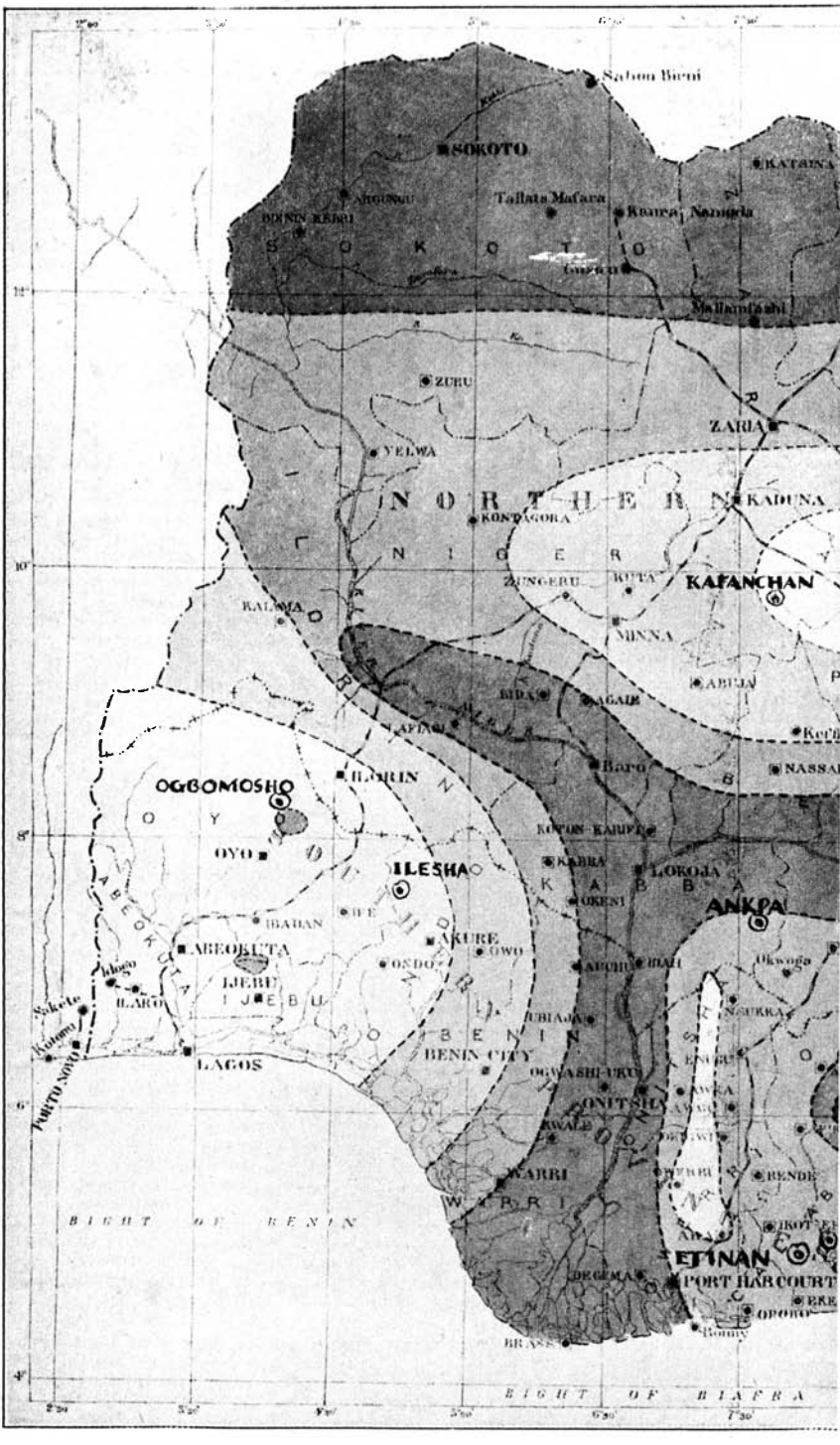
This camp could form a very good nucleus for a Provincial Settlement along the lines recommended in this report. The C.M.S. whose general hospital is a short distance away would be the most suitable mission to undertake this work. Co-operation with the sleeping sickness workers in this province might be considered. The camp is under the general supervision of the Medical Officer, Zaria.

3. *Katsina Leper Camp.* Visited on 10th April, 1936. This camp is superintended by Mr. Crayfird, a Toc H worker, and is under the supervision of the Medical Officer, Katsina. It is situated about 5 miles distant from the station. There is a house for the superintendent near the camp. The great

17. Court of Justice presided over by leper chief. 18. Church from behind the pulpit.
19. Some of the nurses—a pause in the day's work. 20. A street of the settlement—making palm thatch and fish traps.

(17—20 are **from the Itu leper settlement, S. Nigeria.**)

21. Debonding: an entrancing occupation. 22. A game of skill.
23. Pounding the evening meal of casava and 24. Finger shortened by yaws, not leprosy.



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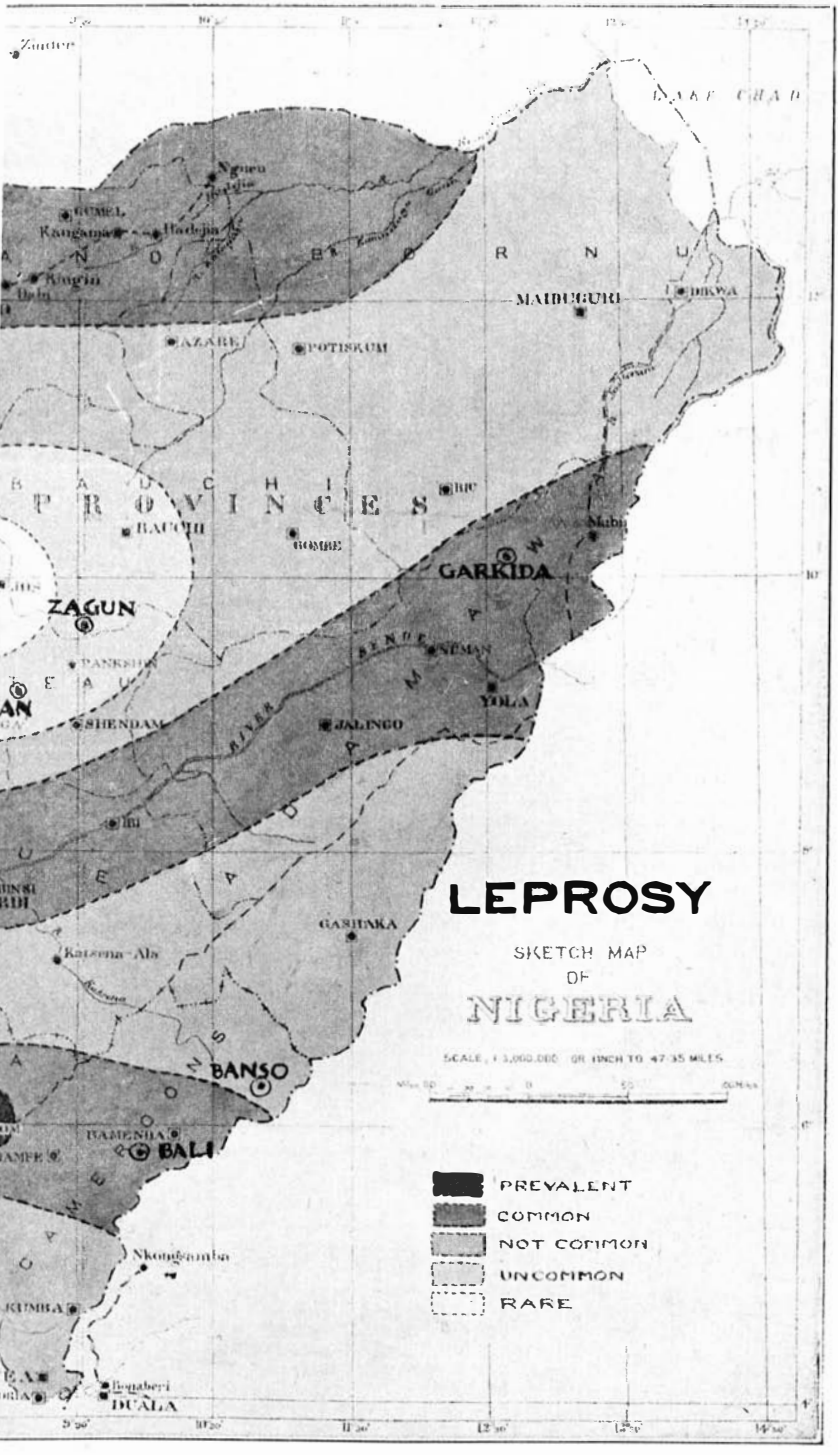
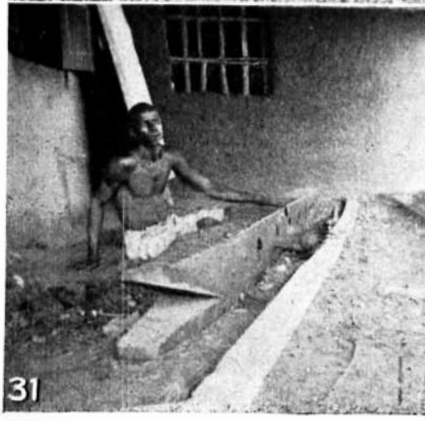

LAKE CHAD
MAIDUGURI
DIKWA
POTISKUM
BAUCHI
PROVINCES
BAUCHI
GOMBE
GARKIDA
ZAGUN
YOLA
JALINGO
SHENDAM
GASHAKA
BANSO
BALI
Nkongsamba
DUALA
LEPROSY
SKETCH MAP
OF
NIGERIA
SCALE, 1:3,000,000 OR INCH TO 47·35 MILES
PREVALENT
COMMON
NOT COMMON
UNCOMMON
RARE



25 & 26. Children bathing in Lake Bosumtwi.
27. Scout band at village near Ho.
29. Seven lepers correctly picked by local chief from a group of 30 skin disease patients. Makeni.
28. Last stages of crippling from leprosy.
(25—28 are from the Gold Coast.)
30. Case of yaws (with his 6 children) isolated by the same chief under mistaken diagnosis of leprosy.

majority are of the crippled, hopeless type, and out of over 200 patients, only 15 are at present able to work. The buildings are all of mud and are at the one side of the camp. The 80 huts for the patients are in six rows, well spaced out. The sanitary arrangements are good. Water is at present inadequate, but three wells are being dug. The diet of the patients is poor. Their skin is very dry and cracked. The great need is vegetables and butter. The colony as it is at present is not likely to have much influence on the incidence of leprosy in the province. The Native Administration spend £1,000 a year on the camp. The superintendent in spite of great difficulties, is doing excellent work and is very popular with the patients. There are good prospects for farming on the present site. This camp might form a good nucleus for a Provincial Settlement along the lines mentioned in this report. I understand that the Sudan Interior Mission would be willing to undertake the work of this camp. The Resident, the Medical Officer and the District Officer welcome this suggestion. If this change were made the present superintendent might be employed at Zaria, which, I understand, would welcome a Toc H worker for their camp.

4. *Somaila Leper Settlement.* Visited on 13th April, 1936. There are 70 males, 36 of which are cutaneous cases, and 33 females, making a total of 103. The patients come from the following provinces:—Kano 83, Bauchi 4, Zaria 3, Bornu 3, Katsina 3, Sokoto 3, Enugu 2, French Territory 2. There are only 7 cases of the crippled type. The settlement is under Dr. Howard, assisted by Mr. Lambert, a Toc H worker. During the absence of Dr. Howard, the Medical Officer of Health of Kano supervises. There is a good house for the Medical Superintendent and a site is being chosen for a house for the Toc H worker. The colony has been begun on excellent lines and farming is in progress. It might develop into a Provincial Settlement along the lines recommended in this report.

I understand that the Sudan Interior Mission are offering to undertake the work of this Settlement as well as that at Katsina. I think this might be considered after this mission has shown successful work at Katsina, if it is decided to hand over the Katsina camp to them.

It is a pity, I consider, that this settlement is so far away from the city of Kano, but otherwise the site should prove a good one when arrangements for water supply have been made.

5. *Azare Leper Asylum.* Visited on 14th of April, 1936, with the Medical Officer who is in charge. There are about 25 cases, some 6 of which are of the crippled type. They get cooked food from the hospital. They do a little farming, but no proper organisation is possible for such a small number. I think it would be well to send these cases to the Somaila settlement or else to develop the camp into something larger and upon a more self-supporting basis of the nature of a Clan Settlement.

6. *Maiduguri Leper Camp.* Visited on 18th of April, 1936. This camp is about 5 miles from the city. It is superintended by a Toc H worker, Mr. Podrick, under the supervision of the Medical Officer at Maiduguri. Mr. Podrick lives in the City as there is no house for him at the camp.

There are 240 inmates. Of these I found about 50 cases of active leprosy, 140 crippled cases in which the infection had apparently died out, and 50 cases which were apparently suffering from diseases other than leprosy, such as syphilis and yaws. Of the 50 cases of active leprosy, very few, some half dozen, are under voluntary treatment. The rest prefer not to be treated. The whole atmosphere of the place is that of contentment with their lot as lepers. They have all their wants supplied, why should they bother to work or get treated? This must have a very depressing effect on the otherwise hopeful cases.

The object of this camp is to remove unsightly lepers from the streets of the city. It has not, and however much work is put into it, is not likely to have any beneficial effect on the incidence of leprosy. This camp might be left with its present hopeless cases and a new settlement begun at a suitable site along the lines suggested in this report.

I have heard it said that the people in the northern provinces of Nigeria are callous regarding leprosy, suggesting that this is a characteristic of the people as a whole. I disagree with this opinion; the Somaila Settlement disproves it. The reason for the apparent callousness is that such camps as those at Katsina and Maiduguri have been begun on the wrong lines. Meanwhile a small settlement might be begun with the more hopeful cases at a suitable site, and suitable cases added gradually. It would be well, however, in choosing the new site to bear in mind the requirements mentioned in this report, so that there may later be adequate room for expansion. Mr. Podrick could develop this new settlement, and pay occasional visits to the old settlement.

7. *Garkida Leper Settlement.* Visited on 20th of April, 1936. This is conducted by the Church of the Brethren Mission. There are about 475 patients living in small villages. The huts made by the patients themselves are clean, and sanitation is good. The settlement is well conducted and has a whole-time doctor in charge. They have no nursing sister and are at a loss meanwhile as to how to look after the new born children. Dr. Bosler is handicapped in his medical work by having no one to help in superintending building, &c. They have a very good school for children and young adults and should in time be able to train efficient African assistants. They aim at training these and sending them out for health work to the villages. They have one dispenser and one carpenter who are not lepers, all the other African staff is drawn from the lepers themselves. Very satisfactory progress is being made in spite of handicaps. Most of the cases are of a mild type, but there is a certain proportion of maimed cases. Nodular (C3) cases are few. Laboratory work is defective due to lack of staff. This colony is progressing along the best lines. It might develop into a settlement for the Adamawa Province on the border of which it lies, and for the southern part of Bornu and the western part of Bauchi until the latter have suitable Provincial Settlements.

8. *Bauchi Leper Camp.* Visited on the 23rd of April, 1936. I found 28 cases, only 5 of which were frankly infectious. Fifty per cent. were of the deformed, post-leprous type. They get as maintenance threepence a week. There were about 200 cases, but most of these left and went to Auyo, near Hadeija, as there was a rumour of cure through bathing in a pool there. Some 7 came back. They have plenty of land to cultivate, but do very little. I did not see the camp near Gombe, but there is great need for a Provincial Settlement for the Bauchi Province, as leprosy is very common there, especially near Gombe and in the western and southern part of the province.

9. *Vom Leper Camp.* Visited on the 24th of April, 1936. This is a small institution a few hundred yards distant from the Sudan United Mission and its hospital, the doctor of which conducts the camp. The patients work on the local roads for which they are paid and maintain themselves thereby. There are 30 patients of which I saw 24. Of these all with one exception were able-bodied. Five were infectious cases. No bacteriological examinations are done. Three

were cases of doubtful leprosy. The food is good and patients appear to do well. The doctor considered that Vom is not a suitable place for developing a large settlement for the following reasons:—

(1) Food is expensive as it is near the mines.
(2) Ground is expensive for farming as the population is high (7400) in Vom.
(3) The ground is barren.
(4) It is cold at night.

Apparently the incidence of leprosy is not very high in the plateau. The huts of the patients are clean and the camp sanitary.

10. *Kafanchan Leper Camp.* Visited on the 25th April, 1936. This is run as an annex to the hospital by the Medical Officer. There are 6 cases, 4 of which are highly infectious cases.

11. *Mkar Leper Settlement.* Visited on the 27th and 28th of April, 1936. This is 55 miles south-west of Makurdi, and 2 miles from the new government station at Gboko. Dr. le Roux of the Dutch Reformed Mission, runs it in addition to a general hospital. The settlement is about one mile distant from the hospital. Unfortunately just before my visit most of the patients had run away and I saw only 61, which were as follows:—N1—7, N2—26, N3—7, C2—7, C3—11, doubtful leprosy—7. This settlement might very well be developed into a Provincial Settlement for the Benue Province, and as the centre of the scheme recommended in this report. In this the school teachers and others connected with the mission could help materially. Under the present arrangement with only a part-time doctor, further development would be difficult.

12. *Uzuakoli Leper Settlement.* Visited on the 30th of April to the 4th of May, 1936. This is one of the two largest leper settlements in Nigeria. Dr. J. A. K. Brown, the medical officer is a missionary of the Methodist Mission. The running expenses including his salary are met by grants from the Native Administrations of the Owerri Province. These pay the following amounts:—Okigwi £900., Owerri £900., Bende £200., Ahoada £200., Aba £100., making a total of £2300 per annum. Grants of £300., £200 and £50 have been received from the central government in 1933, 1934 and 1935 respectively.

The in-patients and out-patients for last year were as follows:—

	Males	*Females*	*Total*
In-patients. ...	559	258	817
Out-patients ...	172	79	251
Un-infected children in the settlement ...	5	9	14

Since last October 250 free patients have been admitted apart from Native Administration support. These pay on admission 5/- for materials for their houses and have either a deposit in the bank or a promise of support from their relatives. These are chiefly cases from the immediate neighbourhood, which shows the high incidence of the disease. These support themselves largely by farming either land given by the settlement or land rented from neighbouring landowners. There were 48 deaths during the year. Of the present cases 20% are early cases, 60% advanced but able-bodied cases, 20% advanced and disabled. The patients are employed in making houses, repairing houses and roads, as nurses, temperature clerks, police, sanitary inspectors, teachers, etc. The industries are carpentry, smithing, soap manufacture, &c. Farming is both communal and individual. The latter is considered the best as it gives better results. The individual interest provides the necessary incentive.

Seed is given to the farm and 20% of the produce has to be returned for initiating other farms. There is an African non-leper laboratory assistant trained in Lagos. All patients are given preliminary treatment for accompanying diseases.

Infants born in the settlement are separated at birth and kept in a creche where they are fed artificially. The mothers see but do not handle their children. Uniformly satisfactory results are obtained. Mrs. Brown the wife of the doctor, herself a nursing sister, has developed this side of the work and has trained African assistants.

Dr. Brown, the Medical Officer of the Settlement, estimates that there are about 25,000 lepers in the Owerri province. To deal with these effectively he suggests 20 out-patient dispensaries in touch with and supervised from the central settlement. This plan would fit well into the scheme suggested in this report.

The discipline of the settlement is excellent. There is a brass band which leads the singing in the large church which holds about 800. The whole atmosphere of the settlement is one of hope, activity and cheerfulness. Unfortunately Dr. and Mrs. Brown have to leave for family reasons, but a new doctor is coming out to take over the work.

13. *Settlements near Afikpo.* Visited with the Senior Health Officer of the Southern Provinces on the 5th of May, 1936. I have already referred to these in my report under Clan Settlements.

14. *Itu Leper Settlement.* Visited from 8th of May to the 14th of May, 1936. This is the pioneer settlement of this kind in Nigeria and is by far the largest. It was founded and is superintended by Dr. Macdonald of the Church of Scotland Mission. He is assisted by Mr. Paterson in the industrial side of the work, and by Mr. MacGregor a Toc H worker. Unfortunately Dr. Macdonald had not returned from leave at the time of my visit. During his absence the settlement is supervised by Dr. Lloyd, the doctor of the General Mission Hospital. Of the 1514 patients in residence on April 1st, 1936, 436 are from the Calabar Province, 309 from the Owerri Province, 228 from the Ogoja Province, 512 from the Onitsha Province, and 11, 16 and 2 respectively from the Benin, Warri and Cameroon Provinces.

The reason for patients gathering from other Provinces is that when this settlement was formed other settlements were not available in the other provinces.

The grants received from Government and Native Administrations are as follows:—

		£
1931-32	=	2627
1932-33	=	2560
1933-34	=	2537
1934-35	=	3120
1935-36	=	2619

From these grants are paid the salaries of the Medical Officer and Mr. Paterson. Considering the large number of patients the expenditure on the colony is surprisingly small.

The Itu settlement has served as a model for other settlements founded later, and considerable benefit has been derived by those who have received training there.

In addition to agriculture, several industries have been developed, such as palm oil, soap making, lemon grass oil. There are carpenters and blacksmiths work shops. The discipline is excellent, being maintained by a Native Court under the presidency of a Chief. One of the most impressive scenes is the large congregation gathered on Sundays in the church which was built by the lepers themselves at a cost of £120. The singing of the 10 to 12 hundred people is led by a well trained choir and a brass band. Round this centres the religious and social life of the lepers. Without the

development of this side of the work no settlement is likely to be conducted satisfactorily.

What the future development of this colony will be it is difficult to forecast. I consider that, as other Provincial Settlements are formed, the patients should be more and more restricted to those from the Calabar Province as far as is practicable. It would, however, be a mistake to carry out any sudden changes such as transferring the 512 from the Onitsha Province to the Oji River Settlement. The latter must be allowed to grow gradually and assimilate its population. On the other hand, a more rapid transference of the 309 patients from the Owerri Province to the well established Uzuakoli Settlement might possibly be considered advisable, but this should not be done without careful consideration of all the points at issue.

15. *Oji River Settlement.* Visited on the 17th of May, 1936. This settlement is situated in the Onitsha Province between the towns of Enugu and Onitsha. It is under Dr. Money, a C.M.S. Medical Missionary, who is assisted by Mr. Parker, a trained dispensing chemist who is one of the Toc H workers. The doctor's salary is supplied by the Halley Stewart Trust through the British Empire Leprosy Relief Association. The settlement has not yet begun; but the administrative buildings have been constructed and one block of huts will be ready for the first batch of patients in about 6 weeks time. The capital expenses have been met as follows:—

	£
Government	1,000
Native Administrations ...	1,600
Fund of Dr. Hasden, (C.M.S.)	1,500
B.E.L.R.A.	500
Mission to Lepers	500
Total ...	£5,100

For running expenses I understand that the following sums have been arranged with the Native Administrations of the Onitsha Province:—£300 a year for drugs, £100 a year for extras, £1,000 a year at £4 a head for 250 patients. This settlement should form an excellent centre for development along the lines suggested in this report. I think that it would form a good centre for training in laboratory, clinical and leprosy control work. For this end I have recommended (see section on training) that the medical officer be deputed to study leprosy in India for a few months. During this period the settlement would be superintended by Mr. Parker.

16. *Ossiomo Leper Settlement.* Visited on the 19th of May, 1936. This settlement is situated between Benin and Agbor at about 10 miles from the latter. About £10,000 was spent on the original buildings which include permanent dwellings for the patients. The medical superintendent is Dr. Lengauer, who is assisted in her work by four other ladies, two looking after the nursing, one the education and one the welfare work. The money for the upkeep is contributed as follows by the Native Administrations:—

Benin Province:

Agbor ...	...	£400 a year
Ishish ...	...	150 „
Kukuruku	...	50 „
Ugwashi	...	150 „

Warri Province:

Krishobo	...	£200
Jekri Sobo	...	60
Kwalle	...	120

There are 205 patients, which I examined, giving as follows:

	Infectious.	*Non-infectious.*	*Total.*
Men ...	42 (28%)	112	154
Women ...	3 (11%)	24	27
Children ...	7 (28%)	19	26

In spite of the fact that the settlement was not begun on the best lines, the present doctor and her assistants have secured good discipline. All the patients are actively employed in farming and other activities. Sanitation is excellent. There is a good school for the children. The infants home is one of the best I have ever seen.

Now that the settlement is established, during the last 18 months since the superintendent returned, it will be possible gradually to expand its activities, both by adding to the numbers and by extending into village work.

One great necessity is a good water supply. A certain amount of water is collected from the roofs and stored in tanks. But this is quite inadequate, especially in the dry season; and it is difficult to avoid bowel disease and to keep the patients clean and free from skin diseases. Either wells should be made, if this is possible, or arrangements should be made to bring water in pipes from the stream 1½ miles distant. This should be done as soon as possible, as the want of water increases the burden of the staff and especially of the doctor.

17. *Ilesha Leprosy Camp.* Visited on the 22nd of May, 1936. This is a small camp in connection with the Methodist Hospital, superintended by the hospital doctor, Dr. Hunter. There are 33 patients, of which 3 are highly infectious cases. Brick dwellings are being constructed by the lepers with the help of a grant of £100 from the British Empire Leprosy Relief Association.

18. *Ogbomosho Leper Camp.* Visited on the 23rd and 24th of May, 1936. This camp is conducted by the Medical Missionary in charge of the American Baptist General Hospital. There are 80 in-patients and 12 out-patients. There is one large administrative building with a pan roof, and some permanent dwellings for the patients. But recently thatched huts have been put up by the patients themselves, for the accommodation of more patients.

With a whole-time doctor and other staff this camp might develop into a Provincial Settlement for the Oyo Province. The training college connected with the mission might take a useful share in anti-leprosy and other village health work, and some of the missionaries expressed a strong desire to take part in a scheme of this kind. There appears to be much more leprosy in the northern than in the southern part of the Oyo Province. Possibly Oyo and Ilorin provinces might combine in supporting the settlement at Ogbomosho as this place is central for these two provinces.

19. *Sokoto.* I was unable to visit this province. I understand that leprosy is highly endemic there and that the former leper camp was given up as it was realised that the money spent on it was not justified. It was, like the Katsina and Maidaguri camps, of little value from a Public Health point of view. It seems to me that it would be well if possible to have a Provincial Settlement begun there with the assistance of some mission and under the supervision of a Provincial Leprosy Board. Care should be taken in those provinces bordering on French territory that lepers do not find their way from there into Nigerian Settlements.

LEPROSY IN THE GOLD COAST

A SHORT REPORT ON ANTI-LEPROSY WORK IN THE GOLD COAST WITH SUGGESTIONS FOR ITS FURTHER DEVELOPMENT.

1. INTRODUCTORY.

THE British Empire Leprosy Relief Association suggested that their Medical Secretary should visit the Gold Coast, and, after studying the leprosy problem there, make suggestions for its further development of anti-leprosy work. This suggestion was welcomed by Sir Thomas Stanton and by the Honourable the Director of Medical Services. I had an opportunity of discussing my proposed visit with the Director of Medical Services, who was then home on leave, before leaving London. The Acting Director of Medical Services kindly prepared an itinerary and made all arrangements for my tour.

Before visiting the Gold Coast I spent two months in Nigeria, seeing the anti-leprosy work which is being done there and preparing a report on this work with suggestions for a new scheme of development. My experience of anti-leprosy work has chiefly been in India, where conditions are in many respects different from those in West Africa. I was therefore glad to have an opportunity of studying the disease first in Nigeria, where within the last few years a number of large leper settlements have been formed under whole-time doctors, and a considerable effort is being made to deal with the problem from the Public Health point of view. I have supplied a copy of my Nigeria Report to the Director of Medical Services and shall refer to it in the present report, mentioning it as " N.R." and referring to its sections and paragraphs as in the Report.

II. NOTES ON THE LEPROSY INSTITUTIONS VISITED.

Accra Leper Camp. Visited on 1st June, 1936, in company with the Acting Director of Medical Services, the Senior Health Officer and the Port Health Officer.

It is situated beside the sea shore about 1½ miles from the town. It consists of a central two-storied wooden building with an iron roof. The upper storey is at present used as a store, but is available for educated patients when necessary. The lower storey is used as a dispensary and treatment room and provides accommodation for the African Superintendent. The patients are accommodated in wooden huts with corrugated iron roofs, two being housed in each building. The huts are arranged in rows, the accommodation

for the men being a short distance from that for the women. The camp was originally designed as an infectious diseases camp, but has been used as a leper camp since 1920.

I examined the patients as far as time permitted and classified them as follows:—

	Male.	*Female.*	*Total.*
N1.	1	1	2
N2.	2	3	5
N3.	6	5	11
C1.	3	1	4
C2.	10	9	19
C3.	12	8	20
?	2	—	2
Total	36	27	63

Thus 39, or 61.9 per cent, are highly infectious cases, and 11, or 17.4 per cent, are deformed and crippled.

I am informed that about one-third of the patients came from Accra and its neighbourhood, about one-third from other parts of the Gold Coast, and the remainder from French Territory and other places outside the Gold Coast. The patients are given three pence to 4½ pence a day. The cost of maintenance of patients, drugs, etc. is between £360 and £400 a year. There is an African Caretaker on the spot and the Port Health Officer visits the camp and carries on treatment. Alepol is the drug chiefly used.

The soil and sanitation are unsuitable for development as a farm colony.

Ho Settlement. I visited this on 2nd and 3rd June, 1936, in company with the Medical Officer of Ho, who in addition to his other duties gives part of his time to the superintendence of the settlement. The patients are lodged in parallel well-spaced rows of huts. The former thatched roofs have been replaced with corrugated iron since they were destroyed by fire last year. The buildings are in rows, on land sloping down to a small stream from which water is available, though insufficient in the dry weather. A well was built near this stream but has turned out unsatisfactory. The camp is not far from the town of Ho, and a proposal has been made to bring water in pipes from the water supply of the town.

There are about 28 acres of land at present, and a proposal has been made to extend the colony as an agricultural farm similar to those in Nigeria; but I understand that an excessive price is asked by the owners for the surrounding

land. A grant of £1,900 a year is made by the Government for the maintenance of the colony.

Of the patients 264 were ranged up, grouped according to their villages, for my inspection. I divided them into various geographical groups and also classified them according to the type of disease, as seen in the following table :—

	Within the Ewe area about 40 by 60 miles in neighbourhood of Ho.	Other parts Gold Coast.	Liberia.	Nigeria.	French Territory.	Total.
C1.	3	1	—	—	—	4
C2.	19	11	—	—	—	30
C3.	34	17	2	1	2	56
N1.	9	2	—	—	—	11
N2.	52	18	—	1	5	76
N3.	55	16	1	1	4	77
Disease arrested	4	—	—	—	3	7
Non-lepers	3	—	—	—	—	3
TOTAL	179	65	3	3	14	264

I saw also one non-African case.

Thus about 68 per cent. were from the neighbourhood of Ho and 25 per cent. from more distant parts of the Gold Coast. Some 32.5 per cent. may be counted as highly infectious cases, and about 37.6 per cent. as hopeful cases, and about 30 per cent. crippled cases.

The sanitary system is bucket latrines, which are attended to by non-lepers.

A certain amount of farming is done by the lepers, but only a limited amount of land is available for this purpose.

The leper colony at Itu, as shown in the Nigerian Report, is conducted on an annual grant of about £2,600, but this includes the salaries of the Medical Officer and the Industrial Officer. So that Ho, with less than 300 patients, costs more than Itu with its 1,500 patients. As pointed out in the Nigerian Report, a colony can be made largely self-supporting by farming and industries, and it is much more economical to have large settlements with whole-time workers that small settlements with part-time workers.

There are among others three great difficulties in the way of developing the Ho settlement into one like Itu and Uzuakoli, viz. the difficulty in obtaining sufficient land, the great proportion of hopeless cases who have no interest in recovery, and the absence of whole-time European workers.

Yendi Leper Camp. I visited this on 6th June, 1936, in company with the Medical Officer. The care of this camp

is only one of his many duties. The present camp is in the close vicinity of the general hospital, but a new camp is in course of construction about one mile distant. The construction of the new huts has been carried out at a small cost with the aid of the lepers themselves. There were about 15 cases, of which some six appeared to be highly infectious cases. Most of the patients come from villages to the east, north east and south east, that is from East Dagomba. The patients are given a penny or penny half-penny a day. This they supplement as best they can by farming and in other ways, but the Medical Officer did not consider their diet as satisfactory.

Kumasi Leper Camp. Visited on 7th June, 1936, in company with the Medical Officer of Health. There are 25 cases of leprosy. They are lodged in dormitories in wooden buildings with corrugated iron roofs lined with wood. They are supplied with food and they have facilities for a little farming in the neighbourhood of the camp. Of the 25, 8 were highly infectious cases. They came from the following districts:—

Kumasi and neighbourhood ...	6
Ashanti (Adansi)	1
Lake Bosumtwi	3
Coast	2
Northern Territory	13

The patients appeared happy and contented. Treatment is given by the Medical Officer of Health.

Lake Bosumtwi. As this is supposed to be a centre of leprosy, I visited it along with the Medical Officer, Bekwai, on 10th June, 1936. We went about 15 miles from Bekwai to Morontus by motor, then about 1½ miles down to Apewu on the lake. We visited 7 out of the 24 villages on the lake and found 20 cases of leprosy, viz.:

Village.	*Population.* 1931 *census.*	N1.	N2.	N3.	C1.	C2.	C3.	C2N3.	*Total.*
Apewu	231	—	—	4	—	—	—	—	4
Banso	331	—	3	2	—	—	—	1	6
Antasi	—	—	—	—	—	—	—	—	—
Wawasi	41	—	—	—	—	—	—	—	—
Dampe	429	—	—	3	—	—	—	—	3
Juasi	368	—	—	—	—	—	—	—	—
Ankasi	457	1	—	4	—	—	2	—	7
Total		1	3	13	—	—	2	1	20

Thus there were 20 cases in 4 out of 7 villages visited, 13 of these being deformed cases in which the infection had almost or entirely died out.

At Banso the Chief said that there had been 10 cases who attended a treatment centre at Kumasi. But they were all dead now but one. He however, showed us 6 cases. None of these were infectious except the one survival of the clinic = a C2N2 case.

At Juasi the Chief said there had been 10 cases, but they had all died or gone back to their own villages, because, on the advice of the doctor who had previously carried out a survey, the villagers had proposed to isolate them in huts outside the village of Juasi. In all the villages the people looked well nourished and the houses were of a good type and apparently not over-crowded. In only one case was a child living in the same room with an infectious case.

There is abundant fish in the lake, so that the people do not lack for proteins. There is cocoa-farming round the lake, and this should bring in comparative wealth to the villagers. The close proximity to the lake also helps to render the people cleaner than in other places. There is a certain amount of yaws, but not as bad (I am informed by the Medical Officer) as in other villages.

The disease of leprosy seems to have been associated with Lake Bosumtwi from ancient times; but it would appear from our investigations and the type of case most prevalent, as far at least as the 7 villages we visited are concerned, that leprosy is dying out now. Apparently people were sent from outside villages to live at the lake, possibly because it is considered sacred. In India lepers are found in large numbers round sacred shrines, because leprosy is supposed to be the result of former sins which must be exculpated by religious observances. Possibly lepers were sent to Lake Bosumtwi for a similar reason, or else in order to get rid of the danger of infection they were sent to this far off wild place.

Possibly the introduction of cocoa-farming has changed the aspect of this region, bringing wealth and increase of population, where formerly there was only dense bush.

The lake is also apparently increasing in size as there are many old trees standing far out in the water, and the people of Dampe told us that their village was formerly situated far out in the present lake. The place is one of great interest and would repay further careful investigation.

III. DISCUSSION.

Leprosy may be considered from four points of view, viz. the aesthetic, charitable, medical and public health. According to the first, deformed and disabled lepers are an

eye-sore in the town, and a place of refuge is therefore created for them to which they can be removed. From the charitable point of view these victims are looked upon as unfortunates and charitably disposed people supply comforts in the form of food, treats, left-off clothing, etc. The medical standpoint is shown when lepers attend hospital and dispensary for treatment, either of the leprosy itself or of its complications and accompanying diseases. Attendance however tends to be irregular, and while a few receive benefit, the majority are but little improved. The public health point of view is that which endeavours to probe down into the causes of leprosy, to study it as it exists in the villages and to devise means which, however long they may take to bear fruit, will in the end deal effectively with the disease and bring about its control.

From the aesthetic and charitable points of view I consider that something is being accomplished in the Gold Coast. From the medical side very little is being done except by a few keen doctors who are distressed at the frequency of the disease and are seeking to do what little they can in addition to their many other pressing duties. From the public health standpoint something is being accomplished by the isolation of some 400 lepers, about one-third of which may be considered as highly infectious cases. But, in the absence of any clear indication of the actual incidence and distribution of leprosy in the country, it is difficult to say to what extent the spread of the disease is likely to be limited by the partial removal of these cases from contact with the public.

IV. SUGGESTIONS.

(1) *Need of a Survey.* In Nigeria the number of lepers is estimated at 200,000 at least, making an incidence of 1 per cent. on an average. In some places the incidence is much less than this, and in others very much higher.

So far no satisfactory estimate of the incidence of leprosy is available. The 1931 census report shows as much as 4 per cent. in some villages; but these figures are acknowledged by public health workers to be unreliable. Short surveys of very limited extent have been carried out by two medical officers in recent years; but these were not extensive enough to give the necessary data for forming an effective and comprehensive programme.

I consider that the first step necessary is to form a survey party headed by a medical man who has had wide experience of leprosy and who is keen on anti-leprosy work and survey

work. As assistants he should have four carefully selected Africans of Sanitary Inspector type, who are acquainted with the vernaculars. The head of the party would train his assistants in anti-leprosy work first at the Ho settlement, and later in course of village leprosy surveys. The party would then carry out a series of sample surveys in selected areas, seeking to ascertain such particulars as the following:—the incidence of leprosy; the proportion of the various types of the disease; whether the disease is on the increase or decrease or is stationary; the tribes most affected; predisposing causes; the customs of the people regarding leprosy, such as isolating cases &c.

I would suggest as locations for the first sample surveys, Ho, Kintampo, Mampong, Bekwai, East Dagombe, Navrongo and Cape Coast or some other suitable area in the coastal zone.

Each survey would last for some 2 or 3 months and cover an area of 50 to 100 square miles. Clinics would be started, as without treatment it has generally been found impossible to win the confidence of the people and make a successful survey. If in any place as the result of the activities of the party large numbers of patients attend, then when the party passes on to its next centre a suitable member of the party might be deputed to continue treatment, extend the survey and by means of propaganda to induce the villagers to isolate their infectious cases. The place in the survey party of the deputed worker would be filled up by another appointment.

The length of time necessary for the carrying out of these surveys is difficult to forecast, but I would suggest two years in the first place, to be followed by extension if justified by results.

The selection of the personel, and especially of the head of the party, is of paramount importance. He should be appointed *ad hoc*. If no suitable doctor is available locally, a well-trained leprosy doctor might possibly be obtained from India, where this type of work has been in progress for several years.

Several doctors and others have suggested to me that lepers should be forcibly isolated. I would strongly urge the danger of attempting forcible segregation. It has been tried in many places without success as lepers tend to conceal their disease (which in most cases can be easily done), and such attempts at force make subsequent attempts at winning confidence of patients very difficult. Indirect compulsion may however be carefully used through clan chiefs and village headmen.

(2) *Ho Leper Settlement.* I consider that if the survey shows a high incidence of leprosy in this district, the present settlement should be enlarged and developed as an agricultural settlement along the lines of the Itu and Uzuakoli settlements in Nigeria. Some 500 acres of land would be necessary; and if this cannot be had at the present site, then a new site should be selected with the requirements mentioned in N.R. V., 3.

I consider that this settlement could best be run by mission doctors (see N.R. V., 1). It would be financed by Government as at present, and have a staff as in N.R. V., 2. It would develop along the lines described in N.R. V., 4, 5, 6, 7, 8, emphasis being laid on training and making the settlement a centre for leprosy prevention and general public health work throughout the district. Also the formation of clan or village settlements (N.R. VI.), Infant Welfare Work (N.R. VII.), co-operation with the Educational Authorities, (N.R. VIII.), using leprosy as a key disease (N.R. IX.), training of workers, &c. (N.R. X.), should be developed as far as possible.

(3) *An Ashanti Settlement.* The Survey party would soon reveal the need or otherwise for another large agricultural leper settlement in Ashanti, and it would give an indication of the most suitable site.

The present information seems to indicate that there is great need for such a settlement, and that the best site would be somewhere in the neighbourhood of Ejura. It is very important that the settlement be situated in an area of fairly high incidence, so that patients may at first be drawn from these villages and preventive work begun in them on an experimental basis under close supervision from the settlement doctor.

What I have mentioned in connection with Ho regarding the settlement being run by mission doctors, and regarding the site, type of building, work, treatment, training, clan settlements, Infant Welfare, &c., would apply equally to this settlement.

This settlement would be financed by the central Government.

(4) *Northern Territories.* There are indications that the incidence of leprosy is very considerable in certain parts of the Northern Territories. There is at present the small leper camp at Yendi, a few out-patients are being treated at Tamale, and there is, I believe, a small leper camp at Navrongo. The work of the survey party suggested would

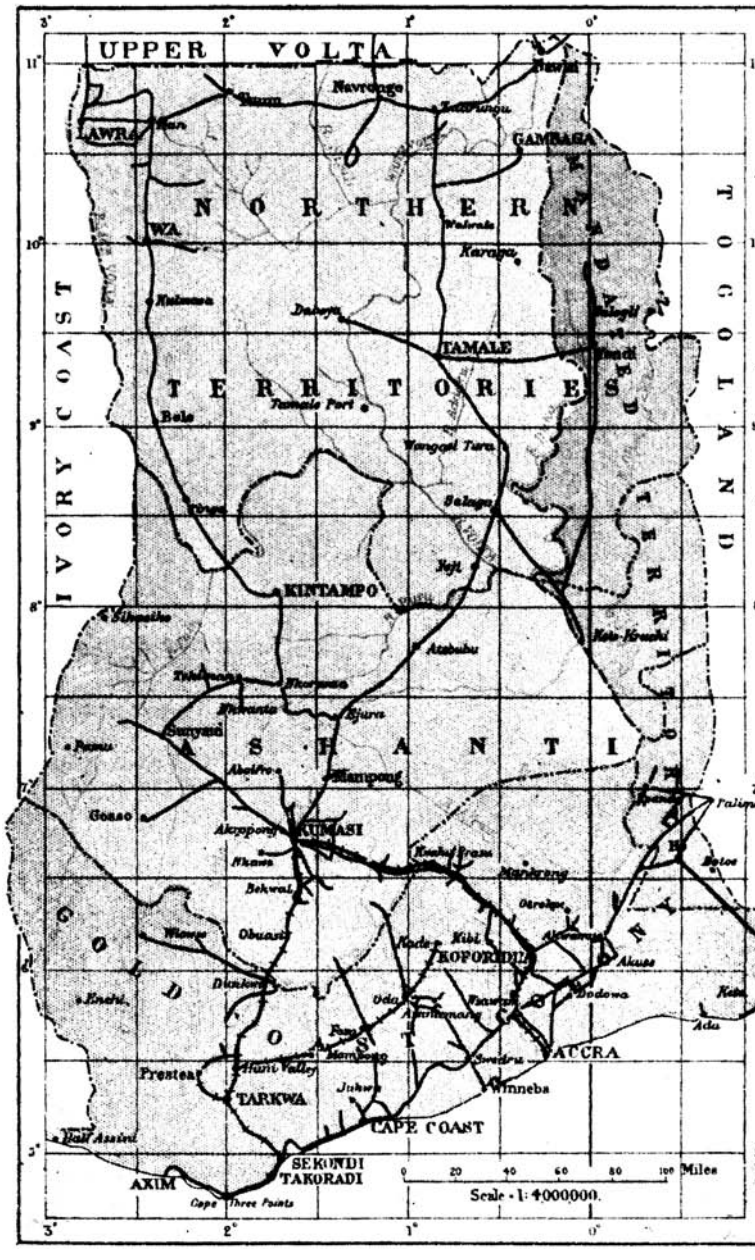
reveal the need or otherwise for a first-class settlement. The large proportion of cases from the Northern Territories in the Kumasi camp, the census returns and reports of Medical Officers would seem to indicate that there is considerable need for this. I understand that the Native Administrations in the Northern Territories may be in a better financial position to support such a settlement after a period of three years. The settlement if formed should be (except for finance) on the lines suggested for Ho. Meanwhile I would suggest carrying on and gradually developing the present work.

In connection with the three leper settlements suggested, if these are to be run by suitable missions at the expense of Government or Native Administrations, it would be well to constitute Leprosy Boards, as described in N.R. IV., 1.

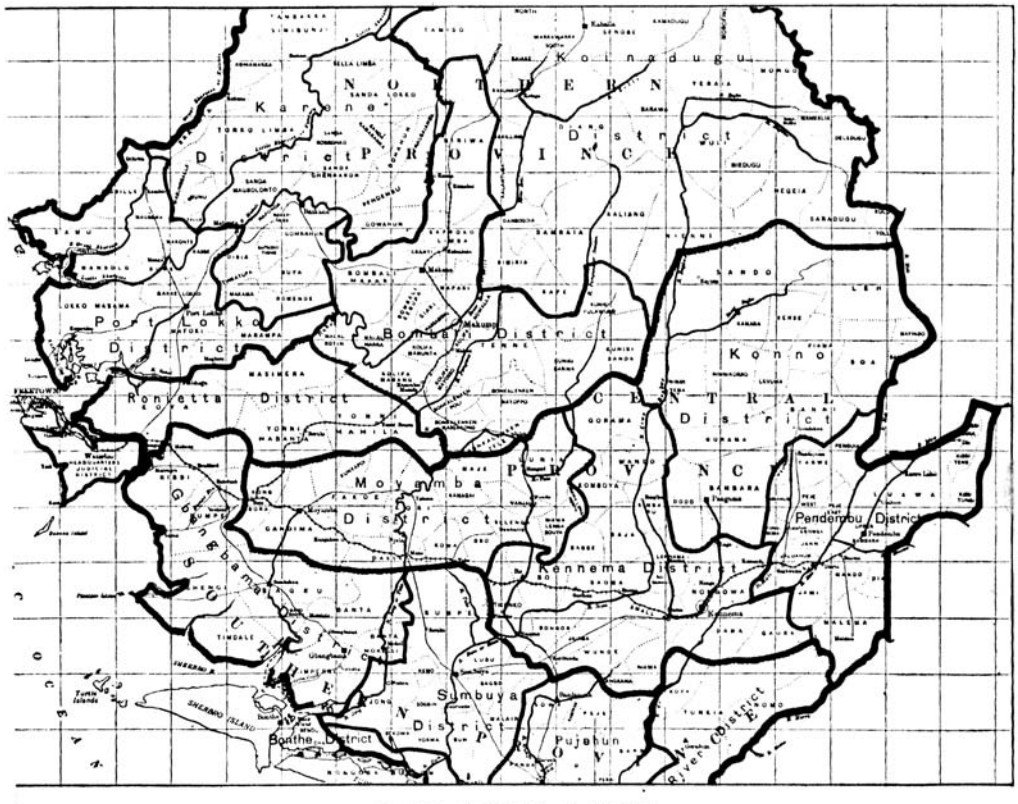
(5) *Accra and Kumasi and other Camps.* I would propose that these be continued as at present in the meantime. That, once Ho and other settlements are developed along the lines suggested, patients be returned from Accra and Kumasi to their corresponding settlements. If the survey in the South seems to justify another settlement, this should be formed. Otherwise the Accra camp might be kept for local or coast cases.

V. ACKNOWLEDGEMENTS.

I wish to thank the Gold Coast Government for help given, and record my gratitude to the Acting Director of Medical Services for kindly arranging my tour, and to him and other medical and health officers for their kind hospitality and the care and trouble they took to place all facilities at my disposal and make my tour successful.



MAP OF THE GOLD COAST.



MAP OF SIERRA LEONE.

LEPROSY IN SIERRA LEONE

REPORT ON A VISIT TO THE COLONY AND PROTECTORATE OF SIERRA LEONE WITH SUGGESTIONS FOR DEVELOPMENT OF ANTI-LEPROSY WORK.

I. INTRODUCTION.

When it was proposed that the Medical Secretary of the British Empire Leprosy Relief Association should pay a visit to Nigeria and the Gold Coast, Sir Thomas Stanton suggested that Sierra Leone should be included in the itinerary. After spending two months in Nigeria and two weeks in the Gold Coast, I accordingly visited this Colony and Protectorate.

My programme was kindly arranged by the Director of Medical Services as follows:—

June 17—19	...	Freetown
„ 20—21	...	Makeni
„ 22	...	Port Loko
„ 23	...	Makeni
„ 24—25	...	Moyamba
„ 26	...	Bo
„ 27—28	...	Daru
„ 29	...	Bo
„ 30	...	Freetown.

I had an opportunity of discussing the subject with His Excellency the Acting Governor, as well as with the Director of Medical Services and the Medical Officers in the Colony and Protectorate.

II. INCIDENCE OF LEPROSY.

Recently a census of leprosy was made in the various districts of the Protectorate. The following table gives the results of this census, along with the area and population of each district, the population to the square mile, and the percentage of leprosy to the population. The districts are arranged in order of the highest percentages:—

District	Area in miles	Population	Population to the sq. mile	Number of Lepers	Percentage of Lepers to Population
Kono ...	2,000	74,000	37	343	0.46
Kailahun	1,500	156,000	104	546	0.35
Moyamba	2,600	131,000	50	430	0.32
Kenema ...	1,700	134,000	78	375	0.28
Port Loko	1,800	170,000	94	442	0.26
Kambia ...	2,600	150,000	57	359	0.24
Bo ...	2,100	168,000	80	379	0.22
Bonthe ...	1,300	98,000	75	190	0.19
Bombali ...	2,700	244,000	90	341	0.18
Pujehun ...	2,100	123,000	58	228	0.18
Koinadugu	5,500	109,000	19	23	0.03

According to this computation there are 3,656 lepers in the Protectorate. In India careful surveys by expert doctors showed that the 1921 census figures were altogether inaccurate, and that the real incidence was from 5 to 15 times as great as those collected by census enumerators unskilled in the diagnosis of leprosy. The discrepancy was due partly to ignorance and partly to intentional concealment. I take it that in a more primitive country like Sierra Leone Protectorate neither of these factors would operate as strongly as in India. Still the probability is that there are actually far more than 3,656 cases. It will be noticed that the lowest incidence (0.03 per cent.) is in Koinadugu, the district with the sparsest population, viz., 19 to the square mile. On the other hand Kono, with the highest incidence of leprosy (0.46 per cent.), has the second sparsest population. The figures for Koinadugu may be compared with the dispensary returns for Kabala, its chief town, which are as follows :—

1930	...	38	new cases of leprosy
1931	...	18	„ „ „ „
1932	...	30	„ „ „ „
1933	...	26	„ „ „ „
1934	...	27	„ „ „ „

Thus in the five years previous to the collection of figures by the District Commissioner no fewer than 139 cases voluntarily attended the Kabala dispensary. As Koinadugu has an area of more than twice the size of the district next in size, and there are no motor roads except that joining Kabala with Makeni, only a small fraction of the cases in the district can have attended the dispensary. It would appear that leprosy is not an uncommon disease in Koinadugu District —far commoner at least than the figure of 23 would indicate.

III. NATIVE IDEAS AND PRACTICES REGARDING LEPROSY.

I have heard it stated that the natives of West Africa are quick to recognise leprosy, but that they are callous about contact with the disease.

In order to find out the truth about this I questioned native chiefs and other intelligent Africans in the various places that I visited. These questions brought out the following facts:—

(1) There is a general belief among the people that leprosy is spread to healthy people by contact with lepers, while many hold that leprosy comes through infringement of certain tribal taboos, yet it is at the same time held that contact with the excretions of a leper, such as sputum and sweat, may lead to acquiring the disease, and that it is dangerous to live in the same house with, or even in the neighbourhood of, a leper.

(2) Three distinct types of leprosy are recognised, viz.:
- (a) that with shortening of fingers and toes and deformity of the hands and feet;
- (b) that with red patches on the face or body;
- (c) that with thickening of the face and ears.

Most of those questioned considered, erroneously, that the first of these is the most dangerous and likely to spread infection. When lepers of different types were lined up, they chose as the most infectious cases those in whom the infection had died out, leaving deformity and trophic ulcers of the extremities, and in whom, because of their helplessness, ring-worm and complicating skin diseases had added to the unsightliness of the victims. Likewise many chose as disease-spreaders second in importance the patients with well-marked macules, and considered the highly infectious cases with thickened face and ears as the least dangerous of all.

(3) Most of those whom I questioned were able to diagnose leprosy from other diseases with somewhat similar appearance, such as ringworm, yaws, elephantiasis and psoriasis. They based this recognition of leprosy upon appearances alone; testing for loss of sensation seemed to be unknown to them.

(4) While it is acknowledged that all lepers should be isolated, this precaution appears to be carried out in only a minority of cases. One chief declared that isolation of lepers was enjoined in the Koran, but said that it was wise not to press pagans too far. Near Makeni a chief told us that one man was suspected of having leprosy and that he was isolated

in the bush. A visit to this man's hut showed him to be living outside the village. Examination showed that he was suffering not from leprosy but from yaws, which had caused a certain amount of deformity. Along with him in his single-roomed hut were his wife and six young children. There were three important facts: (a) isolation from the fellow villagers on the suspicion of leprosy; (b) faulty diagnosis; (c) no attempt at isolation of the young children from their supposedly leprous father, though children are much more susceptible to leprosy than adults.

At Batkanu, a case in which the leprous infection had long since died out leaving deformity, was kept isolated in a separate room. He was covered from head to foot with ringworm which was mistaken for active leprosy.

(5) Children, especially in the first few years of life, are much more susceptible to leprosy than adults, and those infected in childhood tend to develop a much more serious and infectious form of the disease than those infected in adult life. These are the cases which are chiefly responsible for passing on the disease to the next generation. These facts were not known to those whom I questioned. One chief said that leprosy was uncommon among children, and that they did not acquire it until puberty. This remark showed correct observation, but a wrong conclusion from the facts observed. It is true that leprosy often does not *show* itself till puberty, but in these cases infection often takes place in early childhood and spreads through the body, suddenly showing itself at puberty in the most serious form.

Thus we have the power to recognise leprosy, knowledge of its infectiousness, a desire to prevent its spread by means of isolation, and the carrying of isolation into practice by certain efficient and intelligent chiefs and others. The effectiveness of isolation is however negatived by the limited degree in which it is enforced, ignorance as to which is the most infectious type, and misinterpretation of such observations as the comparative rareness of the appearance of signs of leprosy in children.

IV. SUGGESTIONS FOR ANTI-LEPROSY WORK.

In my reports on Nigeria and the Gold Coast I have recommended the formation of large leper settlements with whole-time expert doctors and sisters. Several of these are already in existence in Nigeria. The largest and most effective settlements in Nigeria are run through co-operation with Missions, the funds being supplied by Government or Native Administrations. It is advised that in Nigeria these colonies

be used not only for isolating infectious cases and as centres of treatment, but also as training centres for intelligent patients, who will later, on recovery, take part in the formation of clan settlements on a voluntary basis, in treating cases of leprosy, and in health propaganda work in the villages chiefly with regard to leprosy but also regarding other diseases and conditions which predispose to leprosy. I have also suggested co-operation of the educational authorities in the campaign against leprosy. For details of this scheme reference should be made to the Nigerian Report.

I am informed that through lack of funds and because of many other pressing medical and public health requirements which will need first consideration, the Government of Sierra Leone is unable to afford large monetary commitments for leprosy. At present therefore a leper settlement on the lines of those in Nigeria may be considered impracticable. This would cost, in addition to initial expenses of about £8,000, some £2,500 annual expenditure.

I do not consider that small leper camps such as that at Kissy, near Freetown, are of sufficient importance from the public health stand point to be worth duplicating in other parts of the Protectorate or Colony.

At Kissy the superintendence of the camp forms one of the many duties of the Medical Officer; there are 11 patients, 6 infectious and 5 non-infectious.

I do not consider that the treatment of leprosy as conducted at many of the dispensaries in the Protectorate is likely to cure any but the earlier and more hopeful cases, though the treatment of complicating diseases, ulcers and nerve pains, is of distinct value.

I think there is a danger that the disease may spread as the country develops, and suggest that an effort should be made to educate the people to practise effective isolation.

The little that I have seen of Sierra Leone suggests that there is, at least in certain places, a dread of leprosy, ability up to a certain point to recognise the disease, acknowledgement that it is spread by contact, and a desire to prevent the spread of infection by isolating lepers. Isolation is carried out at present to a certain extent, and this may partly account for the fact that leprosy is not still more prevalent.

If isolation, especially of highly infectious cases, can be effected more thoroughly and intelligently than at present, then there is a likelihood that leprosy will gradually die out. For leprosy, though a difficult disease to cure, is not difficult to prevent.

The salary and expenses of a whole-time leprosy doctor

are not likely to be available at present. A lay worker, however, who has been thoroughly trained in anti-leprosy work, might succeed in carrying out preventive work.

Supposing such a man to be provided, along with his salary, by or through some outside organisation, travelling and other working expenses being met by the Sierra Leone Government or from local sources, anti-leprosy work might be begun on an experimental basis as follows:—

(1) The area for operation would be carefully chosen as one in which leprosy is common, where the native population and especially the chiefs are likely to co-operate, and where help can be had from the Medical Officer, District Commissioner, or some Mission engaged in medical and educational work.

(2) One or more clinics would be begun for the treatment of lepers, but having as their main object gaining the goodwill and confidence of those suffering from the disease. Cases would be followed up from the clinic to their homes, contacts examined, and the history of the disease in the villages worked out. All cases would be listed, a distinction being made between infectious and non-infectious types. The final object would be the effective isolation of all infectious cases from the community and especially from children, as the latter are most susceptible to infection. The lepers could be isolated either individually, or, better, in communities forming leper villages, in which the able-bodied would help those less strong.

In carrying out preventive measures the customs of the people would be studied, and the exact method of procedure might vary in different areas and among various tribes.

In India work along similar lines has given hopeful results. In Nigeria, as mentioned in the Report on leprosy in that country, lepers have voluntarily isolated themselves in villages, while in Sierra Leone at least an attempt at isolation is already being made as mentioned above. I am also informed by Mr. Songo-Davies, Member of the Legislative Council, that the Paramount Chief of Gbagbu (Kenneh Coker of Jimmy town) in the Pujehun District, has already expressed a desire to isolate in separate villages the lepers in his chiefdom. The Paramount Chief of Jawi at Daru has signified a similar desire.

The organisation of leper villages, if properly carried out, is a much better method than isolation individually or even in small groups of 2 or 3. There is the social and economic life of the village, so essential for healthy life; and lepers supporting themselves within a community by their own

farm produce will be less likely to wander into non-leper villages. They would have their own chiefs who would be responsible to the Paramount Chief. As lepers thus segregated would be under a definite economic disability, it might be well to release them from the payment of taxes. It would be necessary however that they should have certificates, renewed every year, from the Medical Officer to the effect that they are suitable cases; and a certificate, also annually renewed, from the Chief and Paramount Chief declaring good behaviour and obedience to definite segregation laws. Relief from taxes would be a distinct inducement towards entering leper villages, and a help towards making them efficient. One of the greatest difficulties in connexion with village settlements would be the isolation of children from leprous parents. This matter is discussed in the Nigerian Report.

The possibility therefore of the success of such a scheme is not remote. If success were met with in one or more areas, the method might be introduced by Medical Officers, District Commissioners and others in other parts of the country, the leprosy officer paying a visit to each district and remaining sufficiently long to initiate the method.

In the meantime a questionaire might be sent out to each district in order to gather more definite information, through the chiefs, of the attitude of the people to leprosy, their ideas concerning the disease, and what efforts are at present in force to prevent the spread of the disease through isolation of lepers. The following is suggested as the basis of a questionaire :—

(1) How do you recognise leprosy?
(2) What types of leprosy do you recognise?
(3) How do you consider that leprosy is caused?
(4) Which type of leprosy do you consider most dangerous, that is most likely to spread the disease to other people?
(5) What do you consider the best plan to prevent leprosy from spreading from a leper to others?
(6) Have you any lepers at present isolated in your area? If so, how many and what types?
(7) In what does isolation consist?
    (a) Is the leper living in a house outside the village?
    (b) If so how far away?
    (c) Is he (or she) living in a separate room of a house in which other adults, or under 10 live?

(d) Is the leper allowed to go into the village or town, or does he do so without permission?
(e) Is he allowed to buy things in the market?
(f) Is he allowed to sell his produce in the market?
(8) What is thought of the danger of infecting young children? Are children considered more likely, or less likely, to be infected than adults?
(9) If a man or woman is a leper, are the children allowed to live in the same house with the leper patient?

In my Report on Nigeria, Section VIII, I have suggested that educational authorities should be supplied with a "practical, well-illustrated guide dealing with the subject." If this suggestion is accepted, copies of this guide might be obtained from Nigeria and supplied to Government Officials and others engaged in filling up the questionnaire.

I consider that Medical Officers, District Commissioners, Missionaries and others, who in the course of their duties visit the villages and come in contact with chiefs and other leading and intelligent people, could do a great deal towards bringing about the effective knowledge, and have before them a definite policy such as that suggested above.

Later, if and when funds are available, I consider that a leprosy unit should be established along the lines recommended in my Nigerian Report. This would include a large Leper Settlement, with one or more whole-time doctors and nurses. If this materialised, the Settlement might be used as a centre of training which would be used not only in the control of leprosy but also in combatting other endemic diseases, dietary errors, etc., and in general public health work.

V. SUMMARY AND CONCLUSIONS.

(1) The relative importance of leprosy, as compared with other diseases and public health problems, should be considered.

It has been shown that the estimate of 3,656 lepers in Sierra Leone Protectorate is probably very short of the actual number. The highest incidence is probably in the Kono, Kailahun, Koinadugu Districts, in the south west of Kambia, and the west of Port Loko District. The actual incidence can however only be guessed at, and cannot be learned till definite anti-leprosy work has been in progress for some time.

In India leprosy is found most commonly among aboriginals when they first begin to leave their primitive life, give

up their tribal traditions, and mix with other peoples. If the same holds good in Sierra Leone, there may be a danger of the spread of the disease in the near future, unless means are taken to control it.

The importance of leprosy should not be judged by its mortality but by the mental and physical suffering which it brings about.

(2) Small leper camps connected with hospitals and superintended by medical Officers as a part of their duties are not of much avail either in the cure of leprosy or in stopping the spread of the disease. They generally shelter the crippled cases which have ceased to be infectious.

Dispensary treatment is of value in dealing with the accompanying diseases and complications of leprosy, but is not likely to lead to cure of the disease except in early and resistant cases; as patients attend for too short a time or irregularly, and it is generally impossible to secure suitable diet and other essentials for recovery.

(3) On the other hand special leprosy clinics are of great value when the patients are followed up to their houses, contacts examined and isolation of infectious cases, preferably in leper villages, secured through teaching the chiefs and leaders of the people the nature of the disease.

In order to initiate this kind of work I have suggested the need of whole-time, especially trained workers, who will try out methods experimentally in carefully selected areas, and later, if successful, extend this type of work. In carrying this out Medical Officers, District Commissioners and Missionaries may render considerable help.

(4) Later a large leper settlement may be started on the lines of these institutions in Nigeria, when funds are available.

(5) A questionnaire to gather further information about leprosy in the Protectorate and Colony is suggested.

(6) The dread in which leprosy is generally held may be used as an incitement towards general sanitary improvements, without which leprosy cannot be controlled.

(7) Release from taxes may be used as an inducement to effective segregation in carefully certified cases.

VI. ACKNOWLEDGMENTS.

I wish to express my indebtedness to the Government of Sierra Leone, to the Director of Medical Services and to the Medical Officers, District Commissioners and others, who planned my visit, and by their hospitality, help and interest, facilitated my tour in the Colony and Protectorate.

Obituary

We regret to announce that Professor Edward Arning passed away after a short illness on August 20th. He was in his 82nd year. Born in Manchester of German parents, he later studied in Hamburg and took his medical course in Heidelburg and Strasburg. He studied skin diseases in Breslau under Oscar Simon and Albert Neisser. From 1883 to 1886 he worked at leprosy and ethnology in the Hawaiian Islands. Arning's experiment in inoculating a condemned criminal with leprosy is well known. The latter developed leprosy, but it was found out later that this criminal had leprosy in his family, and the value of the experiment was therefore negatived.

On returning from Hawaii Arning worked as a dermatologist in Hamburg. He has published many valuable contributions on ethnology, and on various aspects of skin diseases. But his principal work was on leprosy, on all the various aspects of which his writings have helped to shed much light. As a leprologist he is one of the great landmarks of the past.

Correspondence

Bridgetown Club,
Barbados, B.W.I.
26th July, 1936.

The Editor,
The Leprosy Review.

Dear Sir,

There is an inaccuracy in your July 1936 issue *Page 130, under "New Zealand,"*

"Makogai is in the Crown Colony of Fiji and under Fijian jurisdiction."

The co-operaton of New Zealand and Pacific Islands mentioned on Page 111 under Leprosy in Fiji means that these places pay for their lepers sent to Fiji. Makogai is the Clearing Station for lepers in the British Islands in the Pacific and Fiji can well be proud of it.

I lived in Fiji and know many leper stations about the world and am sure of my facts and I think your statement should be corrected.

Yours faithfully,
GEOFFREY W. A. NORTON.
(late Town Clerk of Levuka, Fiji).

Correction.

We regret that in the July, 1936, number, (Vol. VII No. 3.) Page 126, we gave the average number of lepers treated at Malamulo, Nyasaland, as 49.25. The number should have been 249.25. Editor.

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