

LEPROSY REVIEW

The Quarterly Publication of
THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION.

VOL. XXIV. No. 4

OCTOBER, 1953.

EAST AFRICAN NUMBER

167 VICTORIA STREET, LONDON, S.W.1

Price: Three Shillings and Sixpence, plus postage
Annual Subscription: Fifteen Shillings, including postage

LEPROSY REVIEW.

VOL. XXIV, No. 4

OCTOBER, 1953

EAST AFRICAN NUMBER.

CONTENTS									PAGE
Editorial	...	...	...	...	...	...	J. ROSS INNES		175
Leprosy in Anglo-Egyptian Sudan, East and Central Africa . Introduction.									
							R. G. COCHRANE		177
Anglo-Egyptian Sudan	...	...	...	...	...	...	...	...	178
Kenya	...	...	...	...	...	...	...	...	181
Uganda	...	...	...	...	...	...	...	...	184
Zanzibar	...	...	...	...	...	...	...	...	191
Tanganyika	...	...	...	...	...	...	...	...	194
Nyasaland	...	...	...	...	...	...	...	...	208
Northern Rhodesia	...	...	...	...	...	...	...	...	214
Southern Rhodesia	...	...	...	...	...	...	...	...	222
The Leprotic Child in Africa	...	...	...	...	...	...	J. ROSS INNES		224
Leprosy Control in Balovale District, Northern Rhodesia	...	...	...	...	...	...	...	...	231

Edited by Dr. R. G. COCHRANE, Medical Secretary of the British Empire Leprosy Relief Association, 167 Victoria Street, London, S.W.1. to whom all communications should be sent. The Association does not accept responsibility for views expressed by the writers.

NOTES ON CONTRIBUTORS

DR. R. G. COCHRANE is Medical Secretary of BELRA, and Adviser in Leprosy to the Ministry of Health, London.

DR. J. ROSS INNES, is Inter-territorial Leprologist to the East African High Commission, and is a Senior Medical Research Officer of the Colonial Research Service.

DR. J. T. WORSFOLD is Medical Superintendent, Chitokoloki Leprosy Settlement, N. Rhodesia.



Dispel the shadow of leprosy . . .

In the treatment of Leprosy, whether by oral or intramuscular methods, 'Sulphetrone' is the drug of choice. Its proved efficiency and low toxicity place it in a class of its own. In addition to its therapeutic advantages, 'Sulphetrone' is water-soluble; thus, injection is simpler, and more economical than with oil-suspended sulphones.

'Sulphetrone' is issued as compressed products of 0.5 gm. (containers of 100, 500, 1000 and 5000) for oral use; as granules (bottles of 100 gm. and tins of 1 kilo) for the preparation of injection solutions; and as 5 c.c. ampoules of 50 per cent solution (boxes of 12 and 100).

'Sulphetrone'
SOLAPSONE



BURROUGHS WELLCOME & CO. (The Wellcome Foundation Ltd.) **LONDON**

ASSOCIATED HOUSES: NEW YORK MONTREAL SYDNEY CAPE TOWN BOMBAY BUENOS AIRES CAIRO DUBLIN

EDITORIAL

East and Central Africa comprise two natural geographical groups of territories, are contiguous for a small part of their boundaries, share very similar problems in their leprosy work, and there will be found in this issue an absorbing account by Dr. R. G. Cochrane of his tour of both East and Central Africa, as also of Sudan, which lies to the north of all of them. In the modern use of the terms, East Africa is meant to comprise the four territories of Uganda, Kenya, Tanganyika, and Zanzibar Protectorate: Central Africa comprises Southern Rhodesia, Northern Rhodesia and Nyasaland.

For some time now, East Africa has had a practical form of co-operative federation represented by the East Africa High Commission, and quite recently the first steps to Central Africa being a federation have been taken. It is unnecessary to discuss the political aspects of federation. It suffices to say that leprosy workers in both countries anticipate many sound benefits to the cause of control of leprosy being available from any degree of federation.

To those who have to tackle the problem of leprosy in civilized and semi-civilized countries, it must often seem a bad dream that there exist countries of primitive type where leprosy sufferers must be counted by hundreds of thousands, where no reliable system of vital statistics exists, where everything in the leprosy campaign must be established from the ground up. Many elements of the slowly-developing picture of leprosy work in primitive countries can be gleaned from Dr. Cochrane's report. It is a fascinating story, that of the growth and slow gathering momentum of the leprosy campaign in East and in Central Africa.

The first steps are usually taken by Missions, who to their eternal honour, are never slow to see the need that lies around them, nor to react by trying to do something effective to meet it. In Africa, Missions raised the first banner of leprosy relief, aided in many instances by specialised organisations like the British Empire Leprosy Relief Association, the British Mission to Lepers and the

American Leprosy Missions. The first outposts grow and improve, visits are made by such eminent leprologists as Dr. E. Muir and Dr. R. G. Cochrane, and the pattern of the problem begins to emerge. This pattern is further clarified by leprosy surveys, which, like all good leprosy survey work, once begun, is never stopped until leprosy is eradicated in the country concerned. Territorial governments by this time have long been affording solid financial help and all support and encouragement they can give to the existing work, and thought has been devoted to the future. Now it becomes clear that the problem is a big one, and the cry is for more personnel, more money, and more research so that the steps taken should be as efficient as possible. It is this stage that has now been reached in East and Central Africa. The problem is known to be big, and the answer is beginning to be given. Recent appointment of territorial leprologists, Dr. Garrod for Northern Rhodesia, and Dr. Brown for Uganda, is an example of the new appreciation of the need for personnel. Recent approval for the start of a Leprosy Research Unit at Itesio Leprosarium in Kenya, a project which was conceived, delivered, and nourished under BELRA in happy collaboration with the East African Governments, is an example of the far-seeing perception of the need for leprosy research. As regards the need for finance, naturally we are not so happy. It has been estimated that in East Africa we could make a very good, perhaps decisive, attempt at eradication of the leprosy problem there if we had £200,000 per annum. Where are we to get such sums? Nevertheless to have this amount assured for ten years would turn the scale.

The general principles of leprosy prophylaxis and control are well understood. There is no need to argue them. There is a trinity which guides the success of our leprosy campaigns, whether in East Africa or elsewhere, and this comprises knowledge, money and personnel, and the advances in all three will determine success. Perhaps the greatest of all is personnel.

J. ROSS INNES,
*Inter-Territorial Leprologist,
East Africa High Commission*

LEPROSY IN ANGLO-EGYPTIAN SUDAN EAST AND CENTRAL AFRICA

R. G. COCHRANE, M.D., F.R.C.P.

INTRODUCTION.

I had the privilege of undertaking on behalf of BELRA an extensive tour through East and Central Africa visiting Anglo-Egyptian Sudan en route. I left London on September 30th 1952, and returned again on December 17th 1952. This tour took twelve weeks to complete and was, except for internal travel in the territories visited, undertaken by air. It is interesting to note that when I was Medical and General Secretary of BELRA between 1929 and 1935 I made a similar journey in 1930 and the travel time was over twenty-eight weeks or seven months! This emphasises the speed of travel today and the opportunities for much more extensive work.

This present tour took me from Khartoum in the North to Ngomahuru (200 miles south of Salisbury) in Southern Rhodesia in the South, from Dar-es-Salaam in the East to the borders of Angola (Portuguese West Africa) in the West. Wherever I went I was most cordially welcomed and the arrangements for my itinerary were such as to enable me to see a very good cross-section of the work. I am most mindful of the assistance and help of the Directors of Medical Services of the territories visited, but I would particularly like to record my appreciation of the splendid co-operation of Dr. J. Ross Innes, the Inter-territorial leprologist of the East Africa High Commission, who most kindly accompanied me on my safaris in Kenya and Uganda. The Directors of Medical Services of Tanganyika, Nyasaland and Northern Rhodesia made excellent arrangements for my visit and this enabled me to see more of the work than I originally thought possible.

I had the opportunity of discussing the leprosy situation and future developments, plans and policies with Dr. J. A. Kinnear Brown, Specialist (Leprologist) to the Government of Uganda. Dr. Garrod, Leprologist-designate of Northern Rhodesia, accompanied me personally through that territory, and from his knowledge and experience and his seniority in the service was able to acquaint me with local conditions and so made my task easier. With this introduction I will pass on to a review of leprosy in each of the territories visited.

ANGLO-EGYPTIAN SUDAN

Unfortunately because of the extensiveness of my tour, I was unable to do more than have a glimpse of the work which BELRA in co-operation with the C.M.S., are doing at Lui. In a forthcoming number of the Review will be published a summary of a survey undertaken by Mr. Vear of some of the tribes in this area, and certain comments and suggestions are made with reference to this work. I met Mr. Roscoe at Khartoum, and visited with him the Government camp at Matogany, fifty miles from Juba, and Liweri-Lokwe, some 10 miles from Juba. I proceeded then to Lui and spent several days with Dr. Lanton and Mr. Vear. When at Lui I visited Bahrolo, some 50 miles from this station.

The general leprosy situation in the Southern Sudan seems to be similar to that in 1930, when I last visited the area. Dr. Richards, the Director of Health, now D.M.S., was of the opinion that leprosy, particularly in Bahr-el-Ghazal and Mongolla areas, was as prevalent as ever. In 1930 there were large leprosy camps at Li-Rangu and Yubo. These, owing to difficulties during the Second World War, were either much reduced in size, or completely abandoned, and the whole control scheme originally envisaged has been seriously affected. In the Zande Country industrialisation is proceeding at a rapid pace and already there is a large modern factory for weaving local cloth. Muir and others have pointed out the possibility of the spread of leprosy when the primitive aboriginal state gives place to semi-civilised industrial conditions. It, therefore, appears to me that an investigation might be profitably instituted to ascertain the present position of leprosy in the Southern Sudan and to organise a leprosy service, which would not only check the spread of the disease, but ultimately bring it under control.

It would be unwise to recommend the expenditure of large sums of money for the control of leprosy in the Sudan, for, taking the Anglo-Egyptian Sudan as a whole, leprosy is not a major problem, except in this area and possibly among the tribes of the Nuba Mountains, where Dr. Duncanson is working. It is especially difficult to undertake a widespread anti-leprosy campaign because the Medical Service is not at present up to strength and there is a great shortage of Medical Officers. Nevertheless, with the increased possibility of more rapid control of the disease through sulphone therapy, it seems that a revival of the system of leprosy camps would be more likely to lead to success. Sleeping sickness is still a problem in this area, and the combination of a trypanosomiasis and a leprosy campaign should lead to success in combatting both diseases.

It is difficult to make definite suggestions with reference to the development of a leprosy service, for, in the first place I was unable to make a thorough investigation and the political future of the Sudan is at present in a state of flux, and it was felt that this was hardly an opportune moment to make detailed recommendations.

It seems, however, that if staff is available, limited surveys in certain areas might be continued. If, these surveys could be repeated over say, a two to five year period, interesting and valuable information would be collected with reference to the natural course of leprosy in the areas surveyed.

It appears from all accounts that leprosy is still moderately prevalent in the Zande country—especially the area around Yambio and Yei—and a more intensive investigation seems to be indicated, in view of the rapid industrialisation of the Equatorial Province of the Sudan. It would appear to be a practical and feasible possibility to develop the institution at Lui as a Central Institution for the tribes in this area, particularly the Moru and Bari tribes, and to organise around such an institution experimental segregation camps, allowing for modifications due to local tribal customs, somewhat similar to the Nigerian system. If this were done, valuable experience in developing a leprosy control scheme would be gained, and any system which experience indicated would be practical could be extended throughout areas of relatively high leprosy endemicity when conditions were more favourable. Further, the place of therapy in the control of leprosy could, over a period of years, be studied and the influence of therapy, under controlled conditions, in the prevention of leprosy be assessed.

Owing to the paucity of Government hospitals in the Southern Sudan, I believe Lui and its associated clinics and camps could be developed into an effective anti-leprosy centre. Both here and elsewhere in East and Central Africa there were a considerable number of quiescent and arrested cases, and, when therapy is more completely organised, arrangements should be made to give priority of admission and treatment to the infective and active cases, so that effective therapeutic measures may reach the maximum number of persons and do the greatest possible good. I shall be stressing, throughout my whole report, that there are two aspects of leprosy work:—

1. The treatment of active cases, particularly the infective cases, and the control of leprosy, and—
2. The rehabilitation of the crippled cases, and provision for the needs of the permanently deformed.

In countries where medical services and financial resources are limited, priority must be given to the first of the above objectives. It is true that no State can be considered fully developed until there are adequate arrangements for dealing with the crippled and caring for the mutilated, but this is the duty of the Social Services, and missionary and philanthropic organisations, which are specially suited to this type of work, should be assisted in their task in so far as the financial resources of the country allow. In this connection it may be said that surgical measures, e.g. orthopaedic and plastic surgery, for the rehabilitation of leprosy patients, are of great importance.

Not only in the camps in the Sudan, but throughout East and Central Africa a disquieting feature was the freedom given to healthy children to associate intimately with infective relatives. The developing of sulphone therapy as a prophylaxis, and the possibility of B.C.G. vaccination, may to some extent minimise, this risk, but Dr. Lowe's warning with reference to this matter must be given careful and due attention. I quote his statement:—" It should be made perfectly clear to everyone concerned that B.C.G. vaccination of those exposed to infection does not remove the necessity for taking every possible step to prevent or minimise contact between open cases of leprosy and healthy persons, particularly children." It will be a considerable time before adequate measures to protect such children are developed, therefore no healthy children should be allowed in leprosy camps. In the case of breast-fed babies, these should be separated from their mothers except at feeding times. It must not be forgotten that healthy children should not be brought up in an institutional environment, and that the place of the child is in the village. Therefore every avenue must be explored so as to encourage villagers to take care of children until such time as the parent or parents are certified free from infection. I know that in many instances this may be virtually an impossible accomplishment, but under no circumstances must we assume that such a state of affairs is inevitable, but must strive not to expose the child to the risk of infection.

I would reiterate one of the main principles of all leprosy work and that is to bring treatment to as many infected persons as possible, linked with adequate measures of prevention, so that leprosy as an endemic disease may be brought under control in the shortest possible time. A subsidiary objective but an important one, is to return, when healed, the patient to normal society, or to endeavour to interfere as little as possible with his ordinary life if he is not infective.

KENYA

I arrived in Nairobi from Khartoum on October 9th, and was met at the air-port by Dr. James Ross Innes.

Dr. Ross Innes had planned visits to Tumutumu and Chogoria, but because of the absence of Dr. Irvine and the unsettled state of the area, the latter institution was omitted from my itinerary. Arrangements had been made for me to preach, by courtesy of the Minister, at St. Andrew's Church (Church of Scotland) on Sunday evening, October 12th. This service was broadcast and the address published in the *World Dominion Magazine*, and subsequently reprinted as a BELRA pamphlet.

The four days prior to visiting institutions in Kenya were spent meeting officials, from whom I had a cordial reception and I appreciated the opportunity to exchange opinions with Dr. Anderson, the Director of Medical Services.

A widespread experiment is being undertaken in the distribution of Dapsone (D.D.S.). District Medical Officers are encouraged to give out-patient treatment to all leprosy cases. This system will be watched with considerable interest. It is easy to point out the many obvious and what may be serious objections to widespread distribution of D.D.S. in this way, but that the treatment of leprosy should be extended

as possible is a principle which cannot but be accepted. Nevertheless, time alone will show whether in the long run this is the speediest way of controlling leprosy. Apart from the well known danger of widespread oral Dapsone therapy, the greatest difficulty seems to be in two directions, that it takes in some cases years to render the infective case reasonably non-infective, and that clinical response is not commensurate with bacteriological improvement, and therefore this will add, inevitably, to the number of inadequately treated infective cases. Further, regular bacteriological examinations under such conditions are very difficult, if not impossible to undertake. One of the undoubted advantages in such a method is to secure the active interest of Medical Officers in leprosy and thus bring leprosy into the realm of the ordinary endemic disease of the country with which the Medical Officers have to deal.

It was unfortunate that Dr. Irvine was not at Chogoria because he was the first missionary doctor in East Africa who took up the oral treatment with Dapsone with enthusiasm. With his long experience and great local standing among the African tribes of this area there is every likelihood of his method being successfully applied in relation to his hospital.

The sisters at the Tumutumu hospital, also under the Church

of Scotland Mission, were sceptical as to the tablets being taken regularly after the patients leave the dispensary. The usual practice is to give each patient a month's supply of tablets. Because of lack of staff, and sufficient trained personnel the bacteriological examination is not as thorough as it might be, and this is a cause for anxiety, because it is well known that a person may look healthy, but still have many bacilli demonstrable in the skin.

I left Nairobi on the 15th October with Dr. Ross Innes. We stopped over at Nakuru, where I met Dr. Harden-Smith, the P.M.O. Dr. Smith had a small ward for leprosy cases and was prepared to do surgical work and admit these patients into the general wards of the hospital for emergency medical and surgical treatment. Dapsone was given daily, but we advised that this should be replaced by the standard twice-weekly dosages as laid down by BELRA.

From Nakuru we motored to Kisumu and stayed with Dr. and Mrs. Reidy. Dr. Reidy is the P.M.O. of the Nyanza Province. The next morning we proceeded to Kakamega. This is an old camp attached to the Government Hospital. Owing to the pressure of general medical and surgical work it is only possible for the Medical Officer to visit this colony occasionally—approximately once a week. An encouraging feature of this hospital is that one of the doctors is a surgeon who would be interested in doing surgical work in leprosy.

It is recognised that Kakamega is not suitable for a permanent settlement, and as soon as Itesio is ready this camp will in all probability be closed. Patients are brought here and stabilised on sulphone therapy before they are permitted to attend as out-patients and receive monthly supplies of the drug.

From Kakamega we proceeded to Itesio en route for Uganda. Government are developing Itesio into a modern leprosarium, and this institution has recently been chosen as the headquarters of the Research Unit to be organised by the East Africa High Commission in co-operation with BELRA, under the direction of Dr. James Ross Innes. It is gratifying to note that since my visit Dr. Harden-Smith, who has retired, has accepted the appointment of Medical Officer at Itesio, and as he is a person, not only with a knowledge of the country but with leprosy experience as well, Itesio will proceed towards its objective—a first class leprosy institution for Kenya—more rapidly. Mr. and Mrs. C. Wills have done an excellent piece of work in organising the beginnings of this institution. When we arrived they had just moved into the new house and out of the rondavel (African round house) largely from aluminium, in which they lived for many months.

The manner in which they have been prepared to put up with primitive conditions merits the greatest admiration and is in the best traditions of BELRA workers.

Owing to the tremendous demand for treatment the number of cases presenting themselves as out patients is much greater than the present staff can manage, and the very urgency of the situation has resulted in more attention being given to out-patients than the facilities warrant; but as the medical side is strengthened it is expected that the balance will right itself.

Because of a certain lack of experience here, as elsewhere there seems little discrimination in the choice of patients. There are a number of lepromatous cases, but there is a large proportion of inactive cases which, if retained, will prevent an adequate annual turnover of patients. Owing to the fact that there was no Medical Officer, surgical conditions due to leprosy were not dealt with, but with the appointment of Dr. Harden-Smith adequate attention will be paid to other aspects of leprosy.

Leprosy work in Kenya is still in its early stages, but with the advent of sulphone therapy there has been an increasing desire to speed up the anti-leprosy measures, and the building of Itesio is evidence, if any were needed, of Kenya's desire not to be behind the other East African territories in their anti-leprosy measures. It is inevitable that the new therapy has been greatly stressed and it is confidently expected that preventive measures in relation to tribal conditions will be gradually developed as the country passes out of the present emergency; when this is done the impression created that there is an undue emphasis on therapy at the expense of the less spectacular but more certain preventive measures, will be corrected. It is accepted that the ultimate control of leprosy must depend on the organisation of treatment centres linked to constructive measures of prevention in the form of isolation of the infective cases either in selected tribal areas or in institutions. To lean too heavily on therapeutic measures may bring disappointment in its train and ultimately retard the day when leprosy will be under control. Government, I am sure fully realise the position, but they must first respond to the demand for treatment created by the sulphone drugs and then through a gradual process of education, convince the people that this is not sufficient, so that they will be prepared to do more and insist on the isolation of the infective case, particularly from children.

While, it is admitted that leprosy is only one of the endemic diseases of the Colony and Protectorate and by no means the most important, yet it must be borne in mind that it is a disease which seriously disturbs the African mind, and a forward policy in this

respect will pay higher dividends politically than would be expected in relation to its prevalence.

From Itesio we went to the Border Inn at Busia, kindly accompanied by Dr. Reidy, P.M.O., of Nyanza Province and the next day commenced our Uganda safari.

UGANDA

I had the advantage of Dr. Ross Innes' company throughout my tour in Uganda and this was particularly helpful as he was well acquainted with the leprosy work. The Uganda Government has indicated its interest in leprosy by being the first territory which has appointed a territorial leprologist—Dr. J. A. Kinnear Brown—who has had many years of experience in West Africa and was the founder of the now famous Uzuakoli leprosy colony in Nigeria. On Dr. Brown's return from leave I was able to discuss matters fully with him.

The first institutions which I visited were Kumi and Ongino where Dr. Wiggins and Miss Laing did such good pioneer work in the early days.

Kumi is the children's section of the work and Ongino the adult colony. There are disadvantages in these two institutions being separated by several miles, but the policy of having a separate institution for children is a sound one, for children demand special care and attention, and facilities for mental and spiritual development are essential to the child's future development as a useful citizen. Now that sulphone therapy has given great hope it is expected that the great majority of children, in due course, will return to the villages from which they originally came.

Kumi and Ongino are understaffed, but recently through the action of BELRA the staff is being increased, and it is hoped as a result these institutions will develop their usefulness still further.

While at Kumi and Ongino I examined most of the patients. Here, as elsewhere, there were many with residual lesions, which were hypopigmented, but inactive. Such lesions should be given intradermal injections, for only in this way will many of these lesions repigment. A mark on the skin, no matter whether the lesion is healed or not, is unsightly to the patient and every attempt should be made to discharge patients with as few visible stigmata of the disease as possible. Here, as elsewhere, the main cause for

UGANDA AND NORTHERN RHODESIA



LEPROSY SETTLEMENT SCHOOL
AND CHILDREN,
BUNYONYI, UGANDA.



PATIENTS HOUSES,
CHITOKOLOKI, N. RHODESIA.



SICK LINES,
ALITA CENTRE, UGANDA.

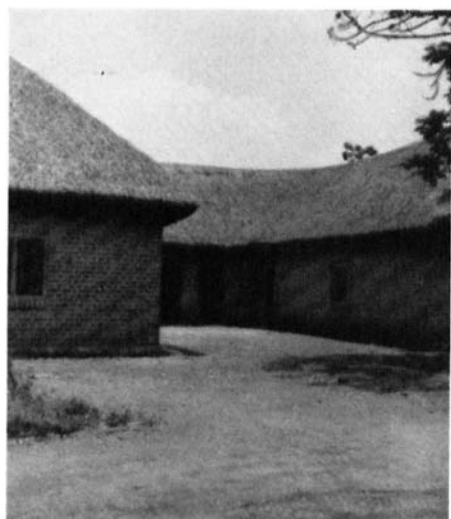


LAKE BUNYONYI,
FROM MAINLAND.

TANGANYIKA AND NYASALAND



GENERAL VIEW OF HOSPITAL
AND TREATMENT CENTRE FROM
HOUSE, CHAZI, TANGANYIKA.



NEW HOSPITAL,
MAKETE, TANGANYIKA.



PATIENTS HUT AMONG BANANAS,
MAKETE.



GENERAL VIEW OF HOUSES,
MALAMULO, NYASALAND.

the delay in the full development of this institution is the lack of money. It is to be hoped that the plan for developing Kumi and Ongino, under Dr. Brown's scheme, into a good primary centre, will be hastened. As I have already indicated, it is good policy to encourage leprosy work, for the African Administration is keen on supporting all efforts towards leprosy control, and today it is well to take note of African sentiment in this respect. Further, as has been shown in India, leprosy is an excellent lever with which to open up the way to the tackling of other vital health problems. Not only this, but in leprosy settlements better methods of agriculture can be tried, and the results of such successful experiments passed on to the community at large.

When at Kumi we visited Lira, about a hundred miles away, where Dr. Wheate and I stayed with the Provincial Commissioner, and Dr. Ross Innes with Dr. Murray Short, the District Medical Officer. Lira is the headquarters of the Lira District of the Eastern Provinces. Dr. Murray Short was formerly at Itu and is now in the East African Medical Service. Dr. Short has organised a most interesting experiment in village segregation. The Leprosy Control Camp, approximately 30 miles from Lira, the Medical Headquarters of the district, is at Atan or Alita and consists of 162 patients (59 men, 31 women, 45 boys, and 27 girls). Of these 50% are lepromatous cases. There are well organised "weak lines" for those needing special care, huts for patients, and mud and thatch sheds for treatment, and another shed which will be used for simple laboratory work. The land is divided into three plots, and the patients cultivate these. It is anticipated that when all the land available is under cultivation the settlement will be self-supporting. The soil appears to be excellent and the crops in good condition. The local African Government meets the running costs and those of hospital supplies, medicine and dressings. A trained Kumi worker supervises the camp and there is excellent discipline and morale.

I was greatly impressed with the whole set up and leprosy dealt with in this way is capable of control. All lepromatous cases should be isolated in such centres and communal life developed. This will give scope for experiments in agriculture and animal husbandry, and be a centre where training for better citizenship (the sociological side of leprosy is of great importance) under village conditions can be achieved. I feel very strongly that this type of satellite centre should be greatly encouraged. Admittedly, further developments will be necessary, e.g., treatment centre, school, and small laboratory. Land cultivation and cattle should keep patients busy and help greatly towards support. The great advantages are that:—

1. The centre is linked to a district hospital, which can cater for the acutely ill.
2. The District Medical Officer and District Commissioner are both enthusiastic.
3. The Agricultural Officer and Veterinary Officer are also ready to give their support.
4. The children are separated and looked after by Catholic Sisters.

A well trained African from Kumi, with the help of local Chiefs, the D.M.O., and the D.C., would be able to maintain an efficient centre. A BELRA-type of worker would be invaluable in such centres.

This type of work emphasises to Medical Officers that leprosy in endemic areas should be linked, as with other endemic diseases e.g. tuberculosis, trypanosomiasis, bilharzia etc.,—to the Government Hospital. Missions and voluntary organisations can help with personnel and in a limited way institutional work, but the control of leprosy is primarily a Government responsibility.

I should mention at this point that I regret very much I was unable to visit Arua where Dr. Williams started the first experiment of this kind. The organisation of the Arua centre has been described in an article in *Leprosy Review* (Vol. 24—No. 2—April 1953).

From Kumi I went with Dr. Ross Innes to Buluba. This is a Roman Catholic institution and is fortunately well staffed, and one of the Sisters is a trained laboratory technician. Records are well kept and biopsy work attempted. Dr. Blenska, who is very keen and enthusiastic, deserves to be encouraged, and as this is the only institution which has the facilities and the staff able to undertake biopsy work, I should like to see some £100 spent to equip the laboratory so that good routine histological work could be undertaken.

The general routine treatment, as in most institutions, is Dapsone (DDS) given orally. Great care is being taken in its administration. There has been one case of severe dermatitis and one mild case, although twice-weekly dosages were given, indicating the need for careful supervision. Parenteral Sulphetrone has been found useful, particularly as a preliminary course for 1-3 months prior to oral DDS being given. There appeared to be a greater number of ulcers and septic conditions than at Kumi. This may be due to the fact that operative and reconstructive work is being done on a larger scale and, owing to a larger staff, more attention can be given to the general medical aspects of the work.

En route for Kampala we called in at the other Roman Catholic institution at Nyenga. This institution, which is also given medical oversight by Dr. Blenska, is well arranged, and, while the laboratory is smaller, the operating facilities are very much better. This institution, along with Buluba, make a centre which deserves every encouragement, for the work is not only excellent, but, being relatively nearer Makerere College, Kampala, has great potentialities. In Nyenga there was another severe case of sulphone dermatitis, which was on only two tablets of DDS twice a week. The Mother Superior was of the opinion that the patient must have procured an extra supply from outside the institution. That is always a possibility which has to be guarded against.

On the way to Kabale, via Kampala, we called at Nsambya, the headquarters of the Catholic Order (St. Francis) which is responsible for the management of Buluba and Nyenga. Mother Kevan, who founded the leprosy work, was most anxious for these institutions to develop along the best possible lines.

On the evening of October 25th we arrived at Kabale on the shores of Lake Bunyoni. At 10 a.m. the following morning we were picked up by Dr. Sharp, in his motor boat, and taken over to the island on which the Leprosy Settlement was situated. This island is set in very attractive natural surroundings, and as a result of propaganda and the willingness of local Chiefs to persuade their leprosy cases to isolate themselves, the incidence of leprosy over the past 20 years has shown a marked decline.

The staff on Lake Bunyoni consists of Dr. Sharp, two nursing sisters and a lady missionary, who is a trained technician. There is another doctor, Dr. Parry, who was away relieving at another mission station. Dr. Sharp, as so often is the case, has to spend much time in general duties, and until there are two doctors permanently stationed in this area it will be impossible to develop this institution to the full. Again the routine treatment is oral DDS. There have been no serious difficulties with treatment. The administration of the drug is very carefully supervised and under such conditions, in the dosages now recommended, there should be no difficulty. One disquieting feature was the tendency to discharge cases too early, and this resulted in early relapses. Because clinical improvement is much more dramatic than bacteriological improvement, it is desirable that a patient should be negative for at least one year before being discharged.

I arrived back at Entebbe on October 26th. Dr. Ross Innes returned to Kenya on the 27th and I paid a visit to Makerere College, where I had the opportunity of discussing matters of mutual interest with members of the staff. I was most favourably

impressed with the whole set-up. There are great possibilities, and it should not be many years before this college becomes one of the outstanding medical institutions in tropical Africa. The staff at Makerere College assured me of their giving whole-hearted support to the proposed leprosy research project for East Africa.

On my return to Entebbe, I met Dr. J. A. Kinnear Brown, whom we had seen for a short while in Nairobi before starting on my safari. Dr. Brown has just taken over as Leprologist to the Uganda Government, and he is making a careful study of the whole situation.

There is no question that Dr. Brown's long-term scheme is sound, but there is also no doubt that there has been a considerably increased public interest in leprosy, and to hasten the development of leprosy institutions and make available finances would, I am sure, pay handsome returns in the form of goodwill and gratitude.

From Entebbe I enplaned for Mwanza and spent two days in this area. As this is in Tanganyika Territory I shall leave its consideration until I describe the work in Tanganyika. I left Entebbe on the 29th for Nairobi and found the tension in that city greater than when I left some three weeks previously.

While in Entebbe I had the privilege of an interview with His Excellency the Governor, and also had discussions with Dr. Hennessey, D.M.S. and Dr. Kinnear Brown, the territorial leprologist. Dr. Kinnear Brown outlined his scheme for the development of primary and secondary residential centres. The policy of the future development of leprosy in Uganda is based on sound principles. It must be remembered that while leprosy is only one of the endemic diseases of the country, and must not receive an undue proportion of attention, yet up to now it may be said that the organisation of preventive schemes has fallen behind the over-all public health programme. As a result of the recent advances in therapy a greater incentive has been given to the development of such schemes, and the Medical Department of the Uganda Government is alive to these issues. It is hoped that the application for assistance for the organisation of primary and secondary residential centres which has been made to the Cotton Association Fund will receive a generous response.

It is generally recognised that, as in Nigeria so in Uganda, the preliminary steps in the development of leprosy work leading up to the point when real advances in the control of leprosy in Uganda can take place, would have been impossible without the help of the BELRA. The contribution BELRA has made in personnel has guaranteed the continuation of the work. As I have said BELRA is essentially a bridge builder and the Association is ever

ready to undertake its share in encouraging sound leprosy work and in initiating research. Governments have accepted the fact that it is their primary duty to control leprosy; the possibility of this has been very much greater owing to the fact that leprosy has now entered the domain of scientific medicine, and greater interest has thereby been created. It is encouraging to know that the Uganda Government is fully alive to its responsibilities in this matter, and it is confidently expected as in many other fields that the Protectorate of Uganda will lead East Africa in organising a comprehensive anti-leprosy scheme which will, in due season, result in the conquest of leprosy as effectively as malaria and other tropical scourges have been controlled.

ZANZIBAR

On November 1st I flew to Zanzibar and was met by Dr. A. C. Howard, the D.M.S. In the afternoon I visited the Leprosy Settlement at Walezo. There were 59 cases, 30 of which were lepromatous. Sulphone therapy was in general use, but there were several cases which would benefit by intradermal injections of hydnocarpus oil. This would hasten the resolution of residual lesions.

The institution near Zanzibar is divided into three sections, (1) leprosy, (2) tuberculosis, and (3) a pauper home for destitute and/or crippled persons. The tuberculosis ward is large and airy and could well be divided and used, in addition, as a hospital ward for patients in the leprosy sector, if they became acutely ill or needed temporary medical or surgical treatment. There are also quite a number of arrested and deformed cases of leprosy. These should be transferred to the sector for cripples, if their relatives will not take them back.

I had several conversations with the Director of Medical Services and Mr. Bromley, the BELRA worker on Pemba Island, and our talk and suggestions can be summarised as follows.

Dr. Ross Innes' overall estimate of the incidence of leprosy is 5 per thousand, giving a total number of cases of 600 in Pemba and 600 in Zanzibar, and is based on a series of sample surveys in which approximately 22,000 persons in Pemba and 10,700 in Zanzibar were examined. It might, however, be found that, as in India,

so here, leprosy is extremely sporadic in its distribution, and that a number of areas have a very much lower incidence than 5.5 per thousand, and therefore the total figure may be somewhat lower.

Mr. Harry Bromley's first task, in co-operation with the Medical Department, should be gradually to find out from where all known cases of leprosy come. The chief aim in sending him to Zanzibar is to assist in controlling leprosy, first in Pemba and then in Zanzibar Island, in the shortest possible period. Therapy, of course, will form a powerful weapon in such a task. As detailed and intensive surveys are completed in Pemba, the pattern of leprosy will gradually be revealed. All open and definitely active cases should not only be treated, but should be in some way segregated. The preference would be isolation at the Leprosy Institution. If this is impracticable, then partial isolation (night segregation) should be considered. Some discrimination should be used with regard to treatment. In view of the fact that control is the primary objective, time should not be spent on the organisation of treatment for all and sundry—this is the task of the Medical Services in relation to disease in general—but every open case and every active case should receive regular treatment, and active cases should be sent to leprosy institutions. If, however, they are within reach of a dispensary and able, if infective, to be isolated from night contact with children, arrangements could be made for local treatment. In areas where the problem is insignificant, and where there are no infective cases, then there is no need to organise a special campaign. The system would ultimately be somewhat similar to that established in Ceylon—viz—

1. Isolation—institutional or village—of all open cases.
2. Follow-up and observation of all contacts, paroled cases, and known non-infective cases. The Health Inspectors could include this in their routine sanitary inspections.
3. Treatment of all active cases either (a) at a leprosy institution, or (b) as outpatients, at the Government hospital or dispensary.
4. The Government hospital should be prepared, where necessary, and when an acute medical or surgical condition supervenes in the course of treatment, to admit patients temporarily to the headquarters hospital.

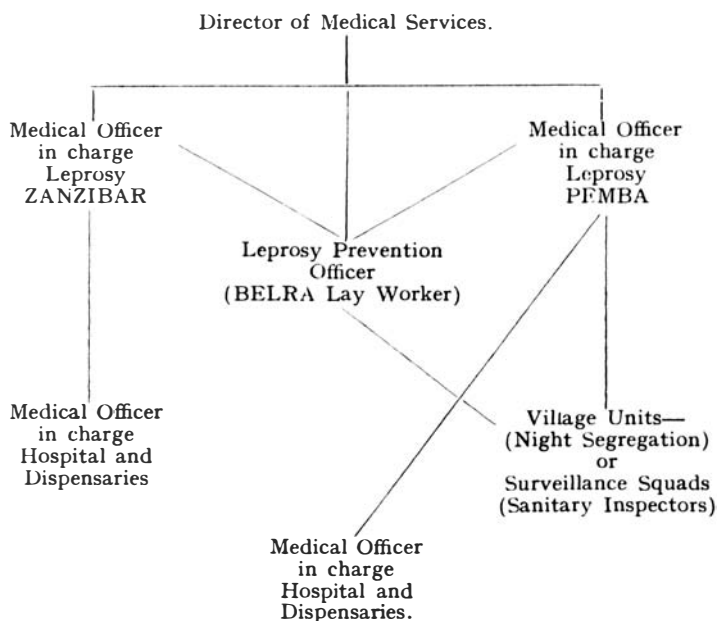
Where a patient either will not, or cannot, isolate himself satisfactorily, and is living with children, then the regulations for infectious diseases should be applied.

I believe, if a well thought out and carefully planned control

scheme, with adequate surveillance and careful supervision of treatment, along with observation of contacts, were organised, it should so affect the leprosy incidence in Zanzibar and Pemba that, without undue strain on the resources of the islands, leprosy would come under control within a relatively short time. Intelligent prevention, however, must be combined with therapy. In this connection all Health Inspectors should receive, on their course, lectures on the control and prevention of leprosy. While there is a BELRA worker on the spot to cover the period of organisation of the control scheme, opportunity should be taken to recruit intelligent Zanzibar nationals, so that they can assist the authorities; and the Government should ultimately assume the responsibility for their payment and allowances.

The following is a diagrammatic outline of the system of control envisaged for Zanzibar and Pemba.

Outline of System of Control envisaged for Zanzibar and Pemba.



(Arrows indicate to whom the individual Officer is responsible.)

Medical Officers in charge of Government Hospitals and Dispensaries are definitely responsible to Medical Headquarters, but would work in co-operation with the Medical Officer in charge of the Leprosy Hospital, and, particularly in Pemba, have the assistance of the Leprosy Preventive Officer.

TANGANYIKA

I arrived at Dar-es-Salaam from Zanzibar on November 2nd and had the privilege of staying with H.E. Sir Edward Twining and Lady Twining. This afforded me an opportunity for preliminary discussion with His Excellency and Lady Twining before starting on my general tour of the Territory.

On the morning of November 3rd Dr. Davis came for me and I had a long talk at the Medical Headquarters with the Deputy D.M.S., Dr. Barrett. It was most encouraging to realise that leprosy was a real priority in the policies of the Medical Directorate. When this is said, I should add that the attitude of the Department is not one which views leprosy as a problem out of all proportion to other public health problems, but there is every effort to maintain a fair perspective, i.e., to organise leprosy control and relief in proportion to its rightful place, as one of the more important endemic diseases. The desire for a forward policy arises first as a result of the excellent pioneer work of Dr. J. Ross Innes, and, secondly, from the fact that with new and improved methods of treatment there is a real possibility of bringing the disease under control.

On November 3rd I left Dar-es-Salaam for Mbeya, where I was met by Dr. Evans, the A.D.M.S., of the Central region which comprises the South Highland Province and the Central Province. On the morning of the 4th November, after a preliminary discussion, I left by Government Land Rover for Makete, some 60 miles away.

I arrived at Makete at about 12.30 p.m. and after lunch I saw new cases. Among these was one extensive dermatitis (not leprosy), one case of fungus infection, and one indeterminate macular case, who also had a large hernia. I was told that one general hospital would not admit such cases because other patients would take their discharge if leprosy patients were also admitted. This, of course, is the usual argument for not admitting leprosy cases who are in need of immediate treatment for some concomitant medical or surgical condition. This has been shown to be an unnecessary fear. The A.D.M.S.'s attitude towards the admission of such cases into hospital is the correct one, and he states that leprosy cases are admitted into hospitals for acute conditions. It would be well, however, if the A.D.M.S. or appropriate officer, would issue a directive on this matter. There is no reason why leprosy cases should not be admitted into hospital, provided their stay within the wards is no longer than will alleviate or cure the acute condition which is complicating this disease. If the disease is non-infective — that is when tested by standard methods of

examination—the patient may be admitted into the ordinary ward; if infective, the case is either nursed under barrier technique or placed in the infectious diseases section of the hospital. In my experience patients with leprosy become restless and tend to discharge themselves if the hospital staff show signs of nervousness. If leprosy is treated like any other disease, e.g., tuberculosis, typhoid, syphilis, etc., the other patients will accept the fact of a case of leprosy in the ward without any alarm. I should say that I have found a willingness on the part of Medical Officers to admit leprosy cases, when necessary, into general hospitals.

On 5.12.52 I spent all the morning and afternoon examining the patients. As in other institutions there was a large number of arrested polyneuritic cases and many had healed or inactive macules. In addition, because of the proximity of the Nyasaland border, many cases sought admission from that Protectorate. While it is not possible to exclude such patients, only those cases which are active, and, preferably, infective, should be admitted, and the Nyasaland Government kept informed of the number admitted into the Tanganyika Settlements. I shall, at the end of this report, be suggesting what I consider should be guiding principles in the admission and discharge of patients in institutions in the Territory.

The patients in this settlement are, as is usual in the East African settlements, allotted a village in which to live. They build their own houses and are given an acre and a half of land, and are expected to feed themselves. The general dietetic condition of the patients was fair. There was no gross malnutrition, although there were some indications of a mild avitaminosis. The three villages are Upper and Lower Makete, and the village of Ngelia. The last is about five miles from the hospital—rather too far away for patients who were crippled and needed a considerable amount of surgical attention. I suggested that patients likely to need hospitalisation from time to time should be concentrated in the Upper and Lower Makete villages.

The hospital built from Red Cross funds was rapidly taking shape and when this is completed facilities for general medicine and surgery will be more adequate. In a community of nearly 1,000 patients a considerable amount of medical and surgical work is necessary and, in addition, obstretrical emergencies are bound to arise. The nursing staff is adequate in that both Mr. Hobbs and his wife are trained nurses. Mrs. Hobbs was dux of her year in the Nursing School. Every encouragement should be given to these two workers. For this reason, if no other, I look forward to the completion of the hospital, for without a properly equipped hospital the staff tends to get discouraged. Further, if a doctor is

to be content with leprosy as a whole-time, worthwhile vocation, he must have every facility to undertake his work.

On the morning of the 6th I examined further patients and checked the smears. As not infrequently is the case, I found this side weak. The stains were old, the microscope old and the technique poor. All these deficiencies will, it is expected, be corrected when the new hospital and laboratory are ready. In leprosy work today reliable bacteriological work is essential. This is particularly the case because the clinical response to sulphone therapy is so far in advance of bacteriological improvement that cases are liable to be discharged as healed, when in reality they are still bacteriologically positive.

Dr. Evans kindly motored me back to Mbeya on the 6th but before leaving we had a general discussion. The following points emerged.

1. The new hospital is to be equipped as for a District Government Hospital, the £15,000 to cover building and permanent fixtures. The grant for recurrent expenditure, which was only £850 (£2 10s. od. per year per patient) is to be doubled. There are to be separate indents for medicines. I suggested, and I will discuss this at the close of the report, when I consider the general principles of therapy, that two kilos of sulphetrone granules should be ordered for Makete as an alternative treatment.

2. The question of the influx of patients from Nyasaland was raised, and it was generally agreed that this should be discouraged, and that local Chiefs and the District Officers should be advised. This matter, however, might be a subject of negotiation between the two Governments. A more important matter needs consideration not only here, but elsewhere, both in East and Central Africa. That is the question of the arrested or quiescent and healed cases. In such cases the Medical Officer should give a certificate stating that the patient is healed, needs no further treatment, and is no longer a public health danger. Chiefs and District Officers should be encouraged to assist the rehabilitation of these patients in the life of the village. In the matter of the helplessly crippled, or those who, for various and legitimate reasons, cannot return to their village, special provision in after-care colonies should be arranged.

3. Both here and elsewhere in East and Central Africa, there is a tendency for District Officers and others to send for admission to institution patients who only have residual lesions, their leprosy having spontaneously healed but leaving the marks of previous infection. All admissions, therefore, should be through the District

Medical Officers, but the Medical Superintendent of Makete should make the final decision as to whether a case is suitable for admission. If such patients are returned to their village, then a statement in writing should be given, so that the local Chief or District Officer may know the reasons why a person is not a suitable case for admission. This means that in order that institutions may be of the greatest benefit in the control and treatment of leprosy admissions must be selective, and no inactive, arrested or healed case should find asylum in the institution.

4. Now that there is a Medical Officer, trained nursing staff and a good BELRA builder, the potential development of Makete is very great, and every effort will, I am sure, be made to prevent the institution being silted up with crippled and arrested cases, for then it will become a dump for those whom the Chiefs consider undesirable inhabitants of their village. The Administrative authorities, however, are well aware of this and only need the necessary assurance from the Medical Department.

5. The question of the care of those who are crippled, but still active cases, was raised. It was suggested that accommodation should be built near the hospital to shelter these patients, and that in instances where the patients were unable to cultivate a plot for their own use, communal shambas (gardens) should be organised, and the able-bodied inmates be required to cultivate these on behalf of the disabled. Thus such patients who are unable to grow their own food would be provided for, and meals could be cooked in a central kitchen and distributed to those in the chronic wards. Admission to the hospital would then only be reserved for acute cases, and for those needing immediate surgical care—e.g. operations.

6. In this, as in many settlements in East and Central Africa, children are a real problem. Marriage should, I feel, be definitely discouraged. Permission should be given to marry by the Medical Superintendent on advice of the BELRA Welfare Officer (Mr. Alderson). Children should be kept in a creche until weaned, and then sent back to their outside village, or go out with the parents when they are discharged, whichever is the shorter.

7. The question of keeping a herd of dairy cows should be considered, for if this is a suitable area, such a step is a great help in improving the nutrition of the patients, particularly the children. The Veterinary Department, however, should be consulted in this matter.

8. All medical staff should be in Government employ, but the Welfare Officer and General Manager (at present Mr. Alderson)

might be considered to be BELRA's contribution. When this side of the work is completely organised, it seems to me that the P.W.D. could then cater for the maintenance of the buildings, and an Agricultural Supervisor might be appointed by the Agricultural Department.

9. Cases who are discharged, or who have been expelled for disciplinary reasons, should be forbidden to build shambas on adjacent land. Otherwise leprosy dumps will only arise over which there is no control. The co-operation of the Native Authority should be sought in this matter.

10. With regard to the laboratory, this needs re-organising, and it would be well to supervise closely the African technician. I believe that this institution is directly under the A.D.M.S.'s office, and this is as it should be. The D.M.S.'s co-operation is essential if the general medical and surgical work is to be efficient and a forward policy in the matter of leprosy encouraged in the district.

After returning to Dar-es-Salaam, where I had further discussions at the Medical Headquarters, I flew, on November 8th, to Lindi, where I was met by Dr. Merson, the S.M.O., of the Southern Province.

I met while in Lindi, the Provincial Commissioner, Mr. Pike, who very kindly offered to accompany me to Newala. Dr. Laufer, the District Medical Officer, arrived on Sunday evening, November 9th, and on the 10th we proceeded to Newala, where we stayed with the District Commissioner. This area is on the borders of Portuguese East Africa, and forms a high sandy plateau of some 2,000-3,000 feet. The whole plateau is waterless, and the main water supply is in the valley. The chief occupation of the villagers, therefore, is the carrying of water from the valley up the 2,000 feet escarpment! There has been a general migration from the valley to the escarpment, probably many years ago, for two reasons (1) The valley is malaria ridden, and (2) As a result of tribal wars the people felt safer, and were better protected from attack by unfriendly tribes. The Government has accepted the fact that the African population will not live in the valley by constructing a pump system whereby water is pumped from the river below up to the escarpment. The people, however, go down to the valley to cultivate their crops, but they will not live down there.

The new leprosarium then, is on the top of the escarpment and the first prefabricated buildings well under construction. I discussed with the Provincial Commissioner, who is very enthusiastic and keen, the general principles involved in the building of

a leprosarium. I personally believe the first necessity is water, and the Government has under consideration another pumping system. It is also possible to construct storage tanks to collect water during the rainy season for an emergency supply. The Government Boma (District Headquarters) has such a supply, with a capacity for 56,000 gallons.

In building a leprosy institution, while the patients should be housed in the African type of hut, it should be so arranged that those needing, or likely to need, most attention should be accommodated near the hospital. There should be an adequate hospital and a laboratory equipped for routine procedures such as blood, stools, urine and smears for acid-fast bacilli. It is hoped that a doctor will be recruited in due course, and that this institution will be the centre from which outpatient activities and village settlements will be supervised.

The present leprosy work is all outpatient work and is superintended by Mr. Heald, who is a BELRA Nurse attached to the U.M.C.A. The medical work is under the supervision of Dr. Taylor, who is in medical charge of the U.M.C.A., hospital, Lulindi. A great deal of hydnocarpus (*chaulmoogra*) treatment is being given. I was told that the patients were very enthusiastic about injections. I, therefore, suggested that hydnocarpus treatment should be reserved for those cases that showed residual macules, and these should be given intradermal injections, but that all active cases should be placed on sulphone therapy. I shall be discussing the general principles in relation to the choice of sulphones, but in so far as the patients are enthusiastic about injections and that equipment and facilities are available, it would be very simple to replace hydnocarpus therapy by parenteral sulphetrone. There is at present a very large stock of sulphertone tablets. I suggested that these should be called in, sent to Nachingwea, or other hospital, where there is a Seitz filter, crushed, filtered and put up as an autoclaved solution (50%) and distributed for injections.

There seems to be a large number of cases of leprosy in the district. Again I stressed the need not only for selective admissions, but the necessity of stopping treatment in those cases in whom the disease was healed, and who only had residual lesions (macules or residual polyneuritic signs).

Another problem, and in this area a serious one, is the large number of patients who filter over from Portuguese East Africa. It appears that much money and time is spent on cases coming from this area and, while it seems hard not to treat such cases, I believe, particularly in relation to the non-infective cases, all persons coming from outside the territory should be refused admission, unless infec-

tive, and that all quiescent and healed cases should be repatriated. The co-operation of the Chiefs and Administrative Officers on both sides of the border is essential in this matter.

The diet in this area appears to be poor. Cassava is grown extensively largely because of its value as a commodity for export. Cattle cake is made largely from this root. The people therefore are encouraged to increase the area under cassava cultivation, and sometimes this results in reducing the cultivable area for beans and millet. It, however, is believed that the growing of cassava does not have much bearing on the present dietetic state. This is hardly likely to improve until the water supply is enhanced.

From Newala we motored to Ndanda, visiting the U.M.C.A. Hospital at Masasi on the way. This is a new general hospital under the Superintendency of Dr. Taylor, the Senior Medical Officer of the Mission, and is severely handicapped for lack of staff and funds.

We proceeded on November 12th from Newala to Ndanda. This is a large Roman Catholic leprosarium of the Benedictine Mission and forms one of the two largest institutions in Tanganyika Territory. The other is at Peramiho, which I, unfortunately, was unable to include in my itinerary. I was most impressed by the excellent work being done here. There was good clinical work, and some of the clinical photography was excellent. Sulphones are being used, but hydnocarpus oil injections are being given to outpatients. This should be changed and only used for cosmetic purposes, and then intradermally. When there is intolerance to Dapsone (DDS) or oral therapy is inadvisable, parenteral sulphethrone (50%) should be the alternative. While at Ndanda I saw all the patients. Again I found many who either need not have been admitted, or could be discharged, without detriment to themselves or to the community at large. I also saw many of the ulcers and discussed technical matters with Sister Mary Lucas, who is a medical graduate. In the evening we had, with Sister Mary Lucas, Sister Thecla (the Senior Doctor) and others, discussions on classification, treatment and operative procedures in leprosy.

I left Ndanda at 8.30 in the morning and motored to Mnero via Nachingwea, again accompanied by Dr. Laufer. Mnero is a Roman Catholic general hospital in the charge of Dr. L. D. Stirling. Dr. Stirling has a large outpatient clinic, and at the time of my visit there were 201 leprosy cases. This was not an outpatient day, but in spite of this nearly all the cases turned up for examination, indicating the enthusiasm for leprosy treatment and the influence of Dr. Stirling on these patients. I examined patients all the morning, and again discussed the question of healed and arrested cases

and their disposal. The hospital itself has a well equipped operating unit and Dr. Stirling stated that from time to time, leprosy cases needing immediate medical and surgical attention are admitted.

This work at Mnero is a model of the type of work a general hospital can do in relation to the treatment of leprosy. As there appears to be a considerable amount of leprosy in this area, it would be well worth considering the question of some form of segregation camp for the infective cases. I would like personally to congratulate Dr. Stirling on the work that is being done, and on the enthusiasm with which it is being conducted.

On November 14th I returned to Dar-es-Salaam, stayed with the Director of Medical Services, and spoke at the Tanganyika Society meeting.

I left Dar-es-Salaam for Morogoro at 10 a.m. on the 15th, arriving at 5.30 p.m., and was met by Mr. and Mrs. Powell and by Dr. Spicer, the A.D.M.S. of the Central and Southern Province. I motored straight out to Chazi that same evening.

I was most impressed by the work at Chazi. The whole institution was well organised. The hospital and treatment centre are thatched, but are neat and clean, and within easy reach of the Resident Superintendent's house. These buildings are temporary, but there is ample space for their replacement by permanent buildings when finance is available. Many of the patients' houses are in a poor state of repair, but when the large number of inactive cases is discharged, this will give an opportunity for Mr. Powell to reorganise the housing and get better houses erected. There is plenty of fertile ground for agricultural purposes. One of the serious problems in this institution is the number of healthy children. A creche is badly needed, for no healthy child should be allowed in an institution after it is weaned.

I saw all the patients and found that out of the 513 cases at present in the institution, some 200, or nearly 40% were inactive cases and could be discharged, as these are no danger to public health. This again emphasises the need for careful selection of cases. In connection with the discharge of inactive cases, the support of the Administrative Officers and the Chiefs must be sought, and the reasons why such cases should not be admitted explained. The question of the crippled case and those unable to return to their villages will be dealt with subsequently in this report.

A great need is the services of a visiting doctor. It is fortunate that recently an orthopaedic surgeon has been posted to Morogoro, only some 50 miles away, and arrangements have been made for him to visit Chazi. I met Dr. Hodges while in Morogoro and he

is very keen to investigate the surgical possibilities of the institution, and, if necessary, transfer patients to the Government Hospital, Morogoro, for operative treatment. Apart from surgery particularly appertaining to leprosy, the incidence of hernias and hydroceles is very large and much surgical work is needed. For the present, however, with Mrs. Powell, who is a trained nurse and physiotherapist, and Mr. Powell as Superintendent, the medical work can be well undertaken if Dr. Hodges can regularly visit this institution and give advice.

The general hospital work was excellent and there was, unlike other institutions, an adequate supply of bandages. The bacteriological work was poor, stains unsatisfactory, and the microscope was not in good repair. As I have said, particularly with the introduction of sulphone therapy, adequate microscopic facilities are essential.

With regard to dressings, many institutions find that supplies of dressings are difficult, for even parcels of old rags are liable to be charged customs duty. BELRA has been assured that duty can be reclaimed if charged on such parcels; but it has been suggested by Lady Twining that all material, dressings, old clothes, etc., should be sent earmarked for leprosy institutions through the Red Cross, and then customs duty does not need to be paid.

I believe Chazi is potentially one of the best institutions in Tanganyika, and when the new hospital is built and an effective liaison established with the Government Medical Officer, the work here should be extremely good. I trust the Government will approve of the erection of a creche for young babies—there is sufficient ground for this in the present hospital area.

I left Morogoro for Dodoma on November 18th, arriving early on the morning of 19th, and was met by Dr. Thom. After breakfast Dr. Thom kindly accompanied me on my safari to Singida, Manyoni and Mkalama. On our way to Singida we called in at the C.M.S. station at Makutupora, accompanied by Dr. Powys, the Senior Medical Missionary. It was unfortunate that Miss Faith Ward the pioneer missionary at Makutupora was away on furlough, for it is never possible to get an adequate impression of an institution when the Senior Officer is absent. There were, however, one or two points which I consider need comment. In the first place, as in other institutions, some 30% of all the cases were either arrested or inactive. Those who could not be rehabilitated or returned to their village should be accommodated in the buildings near the hospital and form an after-care colony or eventide home, as suggested by Dr. Thom. All those who are able-bodied or who can be sent back to their village should be returned to ordinary

life. This institution was organised much more on the lines of Indian leprosy settlements; that is the patients lived in wards and not in native huts under African conditions. This meant that more money was actually spent on food. Those patients who lived in native huts seemed to me rather far away, and, therefore, difficult to supervise. Dr. Thom's suggestion seems to be a sound one in relation to this and other institutions. Crippled cases should be kept in wards near to the hospital unit; the able-bodied should live in compounds not too far away, and go to the nearby shambas for agricultural work.

There was attached to the hospital a small sick-bay and laboratory. Dr. Backhouse, a recent recruit from Australia to the main Mission at Kilimatinde, took much interest, and if the hospital unit is enlarged more medical attention in the work would be possible. Serious operative cases could be transferred to Kilimatinde, but this is rather far away for use by all cases needing hospital treatment.

I suggested that the technician should be transferred to the main Mission hospital for a refresher course. My general impression was that too much reliance had been placed on him, and hence he was somewhat over-confident as to his capabilities. There were several patients who needed orthopaedic operative treatment; and I suggested they might be sent to Morogoro for such treatment. Miss Bangham, the Sister relieving for Miss Ward, stayed at Makutupora. This was important, for it ensured that a Nursing Sister, or some responsible person, was available, for the Mission Station is rather far away for close supervision.

We left on the same afternoon for Singida, calling on the District Commissioner at Manyoni on the way. At Singida we met Dr. Schuppler, who is an excellent surgeon and has studied under one of the best Orthopaedic Specialists in Vienna (Professor Bohler). Dr. Schuppler accompanied us to Mkalama the next day, when I was able to demonstrate the need for operative work.

The Mkalama Institution is somewhat similar to Makutupora, but better staffed. The staff consists of a Nursing Sister in Charge (Miss Fossil), another visiting Nursing Sister (Miss Kjellein)—both from the main Mission Hospital—and a Mr. and Mrs. Petersen, who give general supervision, particularly on the spiritual side. Mrs. Petersen, before her marriage, was the Sister in Charge of the Leprosy Institution. The institution is similar in its arrangements to that at Makutupora. The houses, which are well built, in the vicinity of the laboratory should be reserved for those cases who need constant attention, or are likely to need some nursing care. It is unfortunate that the leprosy institution is twelve miles from

the main hospital, for this makes detailed medical supervision difficult and a tedious journey each day for the Sister in charge. In case of emergency, however, there is a rest room at the Settlement. The more able-bodied patients should be housed under conditions more suited to their village environment. A considerable amount of land is available for cultivation, and is being used in this way.

The more permanent buildings have been damaged, some seriously, through a recent storm. The treatment room, laboratory and hospital are adequate for the purpose provided cases needing more detailed medical care or major operation can be transferred to the Mission Hospital for treatment for their acute condition. I would again emphasise the importance of using local general hospital facilities for the treatment of acute conditions. By adopting this measure in cases of leprosy who need temporary hospitalisation two objects are achieved. Firstly, not only the African, but the hospital staff, come to look upon leprosy in the same way as they do tuberculosis or any other mildly infective disease needing temporary admission into hospital. Secondly, when a hospital is in the vicinity of a leprosy settlement, apart from giving the staff a better insight into leprosy, an important endemic disease, there is afforded a considerable economy in not needing to have anything more than a sick-bay in the leprosy settlement, and the patient receives, what is his inalienable right, expert hospital care. The laboratory technician appears to have been well trained and is keen to better his knowledge. I found a tendency for him to mistake contaminations and artefacts for *M.leprae*. The general principle to adopt in examining smears for *M.leprae* is—when in doubt the acid-fast material, or particles, are not the *M.leprae*. A little further instruction and supervision would help this technician greatly. Again, where a general hospital is within a few miles of a leprosy institution, it seems to be a wise policy to look upon the laboratory staff of each institution as one, so that technicians can serve periods both in the leprosy settlement and in the general hospital.

I examined all the patients in Mkalama and found rather a larger percentage of arrested and quiescent cases here than in other institutions. The percentage of cases that did not need active treatment was approximately 60%. This problem of the rehabilitation of cases fit for discharge is serious, not only here, but elsewhere in East and Central Africa. There is a general tendency to keep cases, especially the non-infective group, under treatment long after all the lesions are healed, and, similarly, to admit early cases in which patches are residual. In other words, greater dis-

crimination is needed in this matter. The result of the present policy is that institutions tend to become silted up with cases for which little can be done, and the more active cases, particularly the lepromatous group, are unable to be treated as inpatients, as there is no accommodation for them. The question of caring for the homeless and crippled needs careful consideration. There is a humanitarian and Christian duty towards such persons, whether they have been crippled by leprosy or through some other cause. Admittedly, in a highly developed country this is the responsibility of the State, but even in Britain, without the active help and support of Christian philanthropic societies, it would be impossible adequately to deal with crippled and disabled persons. In less developed countries Social Services are not so well organised, for financial considerations demand that the main effort must be expended on dealing with acute conditions, and the care of the crippled and maimed is largely left to responsible persons in the community, or to philanthropic individuals. This means, therefore, that until the State is able to afford well developed and organised Social Services, persons discharged from leprosy homes, if handicapped, have either to be looked after by the village authorities, or Missions should be encouraged to establish eventide homes for such persons. In order that the African village authorities can be persuaded to assume responsibility in this matter the co-operation of the Chiefs and District Officers is essential. It is suggested that before any patient is discharged a copy of the discharged patient's certificate is sent to the District Commissioner, and he, through the proper authority, contacts the local Chief, who is asked to take care of the disabled person about to be discharged.

If there is no one willing or able to care for such a person in the village, he should be transferred to a home for the care of the crippled and mutilated. There is always room for the establishment of such eventide or crippled homes and Governments should encourage Missions to assume the responsibility for such work, and help them where possible, with financial assistance. The fact remains that as long as leprosy exists this work will be necessary, but it should not be confused with the more practical aspects of treatment and control. Nevertheless, institutions and hospitals should always be ready to admit temporarily the healed or arrested case for emergency treatment. With regard to the healed case, who is not crippled, but shows stigmata of the disease in an innocuous scar, Chiefs should be educated to the fact that such patients are fully able and fit to return to their villages and assume normal life.

While at Mkalama I had the privilege of Dr. Schuppler's help,

as well as that of Dr. Thom. Dr. Schuppler is an experienced orthopaedic surgeon, and expressed his great interest in the possibility of orthopaedic measures in leprosy, and would be willing to attempt to restore function to paralysed limbs.

Before leaving Singida, I visited the Government Hospital and witnessed the skill and originality of Dr. Schuppler's repair of an upper jaw smashed through a lion maul—this was a remarkable piece of operative skill.

I returned to Dar-es-Salaam on November 24th and was met by Dr. Davis and was taken to the Dar-es-Salaam Club. In the evening I was invited to dine at Government House, where I was able again to appreciate the keenness and enthusiasm of Sir Edward and Lady Twining for a forward policy in leprosy control. My stay in Dar-es-Salaam was spent in discussing policies with those at Medical Headquarters. I also had an opportunity of discussing the Rural Leprosy Scheme, which Dr. Thomas has proposed for Mwanza. The scheme is sound and deserves a trial, particularly in regard to the possibility of the organisation of an E.A.H.C./BELRA Research Unit. I also was able to see something of the treatment in the Settlement near Dar-es-Salaam. The institution has the drawbacks of all urban institutions—it has limited space, and there are a considerable number of arrested cases. Isonicotinic Acid Hydrazide was being used, but it is doubtful whether the conditions are such as to be favourable for this work. Nevertheless, the Medical Specialist is keen and anxious to make the best use of the facilities available.

While in Dar-es-Salaam I also met Dr. Mackie, the Government Pathologist, who expressed his great interest and willingness to co-operate in any investigations in connection with the histopathology of leprosy.

I visited the Mwanza-Shinyanga area of Tanganyika Territory from Entebbe, as there is a regular air service between Entebbe and Mwanza. I arrived at Mwanza at 11.20 a.m. on November 26th and made contact with Dr. Foster, the A.D.M.S. of the Lake Province. The next morning Dr. Foster motored me to Kolondoto, near Shinyanga, the large leprosy settlement of the Africa Inland Mission. This is where the late Dr. Maynard did such good work some 20 years ago. Dr. Covell (the son of Sir Gordon Covell, the Malariologist), the D.M.O. of Sukumaland, accompanied us to Kolondoto. Unfortunately, owing to the time at my disposal I was only able to spend a few hours at Kolondoto. We saw most of the cases and discussed details of therapy, etc., with Dr. Barnett.

As in other institutions, there were a number of cases whose lesions were healed, and who from the public health standpoint

were no longer a danger. This question of the healed case is an administrative problem of importance. It is a fact that the arrested and crippled case, who cannot be re-absorbed into the community, has a rightful claim for compassion. It is just such persons, who are unfortunate, that merit the care and attention of philanthropic institutions, and such an appeal is naturally met by Christian Missions, particularly those interested in leprosy work. This means that there should be a section of every Mission home devoted to handicapped persons. Whether the Government is able to support such work depends on how far it is able to give financial help for the care of the disabled, but the first concern of the authorities is to support, as far as possible, all measures which directly contribute to the control of leprosy, and, where financial resources are limited, grants must naturally be given for the care of those patients who constitute a public health problem. In so far as a certain proportion of these advanced, arrested cases need hospitalisation from time to time, the hospital in the settlement, or a nearby general hospital, might be given special financial consideration for such cases when admitted for temporary medical or surgical treatment. How far financial aid of this kind can be given is a matter of negotiation between Missions and Government.

Before I left Kolondoto there was a conference in the Mission Superintendent's office, in which Mr. Maynard, Dr. Barnett, Medical Officer of the A.I.M., Dr. Foster, Dr. Covell, the D.M.O. Shinyanga, and the District Commissioner and myself took part. Matters of administration were discussed, and I trust I was able to help clear up certain difficulties, which had arisen between the Government and the Missions over matters of policy. The medical work is up to a good standard and the patients here could be used as additional clinical material for therapeutic trials of new drugs.

While at Mwanza I visited the E.A.H.C. Unit for Research, and met Colonel Laurie. I was greatly impressed with the plans and scope of the new research laboratories. Colonel Laurie himself welcomed the idea of stationing the Leprosy Research Unit at Mwanza. While the question of a site for this unit, on the value of which all agree, remains open, the following appeared to me to be reasons for giving serious consideration to Mwanza as the headquarters of the Leprosy Research Project.

1. Dr. Ross Innes and the BELRA unit would be more than welcome.
2. All routine laboratory work can be done by the existing staff.
3. Immediate laboratory accommodation for Dr. Ross Innes, and the likelihood of a house being available in the near future.

4. Laboratory space and an office not only available, but plans exist for providing laboratory accommodation for visiting research workers.
5. Availability for consultation with expert pathologists, bacteriologists, statisticians, etc.
6. There are plans for an African Hospital, where beds would be provided for leprosy patients undergoing special tests.
7. The possibility of building, within a short distance, accommodation for the housing of 100-200 leprosy cases chosen for special research investigation.
8. The proximity of an island where immunological research, and, possibly, a preventive scheme, backed with therapy, can be organised as a pilot unit.
9. There exists reasonable access (a fairly good road which will eventually become an all weather road) to a large and developing leprosarium at Kolondoto.
10. In connection with the contemplated African Hospital it may be possible to plan for orthopaedic and physiotherapy units.
11. The keenness of the Director (Colonel Laurie) to co-operate, and the enthusiasm of the local and central Governments.
12. The economy of development, with very little expense involved in accommodating staff, and minimum of expense for apparatus.
13. The relative proximity of Makerere College, the staff of which maintains the closest touch with Colonel Laurie.
14. A pure research centre, with no responsibility for routine teaching.

Since writing this report certain difficulties have arisen with reference to the proposed Research Centre, and until these have been overcome no firm suggestion is possible with reference to its creation. Its need and importance is universally recognised.

NYASALAND

I left Dar-es-Salaam on 26th November and arrived at Blantyre about noon. I was met by Dr. Park, Principal Medical Officer, and proceeded almost at once to Cholo, where we stayed with the District Medical Officer, who accompanied us the next day to Malamulu, a leprosy hospital of the Seventh Day Adventist Mission. The institution is well organised, but detailed medical supervision is difficult to maintain, as the general hospital work is very exacting.

The leprosy institution is extremely popular, patients coming from all over Nyasaland, and also from Northern Rhodesia. The routine treatment is oral dapsone, which has recently been changed to bi-weekly from daily dosages. Owing to the daily regimen there was considerable difficulty, and six cases of psychosis were encountered. In this connection, as I have mentioned in my Tanganyika report, it would be wise to have an alternative treatment, which I believe should be parenteral sulphetrone, which is non-toxic, and nearly as economical as dapsone, although it has the disadvantage of having to be given by subcutaneous or intramuscular injections. There appeared to be a relatively high percentage of lepromatous cases, but it is probably erroneous to conclude that leprosy may be a serious disease in the area, as patients are drawn from both Nyasaland and Northern Rhodesia. Again, there were a considerable number of healed and quiescent cases. The laboratory was well organised, but I had the impression that the technician needed further experience, for it was difficult to accept the results of the examination. The training of technicians has become of the greatest importance, for with sulphone therapy clinical results are very deceptive. It is well known that the marked clinical improvement so often seen is by no means commensurate with bacteriological improvement.

On November 28th I left Zomba with Dr. Watson en route for Kocira. We called first at Likwenu, a station of the U.M.C.A., and then at Utale, a Roman Catholic Mission station. Dr. Maclean is in charge of the U.M.C.A. medical work and lives at Fort Johnston. He visits Likwenu about four times a year. One sister is in charge of 160 patients. There was considerable difficulty with DDS as daily treatment had been given. It was suggested that twice weekly treatment should be given. There was a good microscope, but with the difficulty of supervision and lack of staff, it was difficult to keep this work up to standard. There was a large number of outpatients, but these were given hydnocarpus oil injections. With sulphone therapy now reasonably cheap, there seems no reason for withholding it. If there is difficulty in controlling oral DDS treatment, it would appear that hydnocarpus treatment should be replaced by parenteral sulphetrone (50% aqueous solution) subcutaneously. As the institution is organised for the giving of injections, it should be easy to change over to sulphetrone injections. On the other hand, provided the tablets are given under strict control, oral therapy can be given; if, however, there is likely to be a misuse of tablets, then injections are preferable. The difference in price per annum is so small that I consider the safer sulphetrone granules given by injection are more suitable for out-

patient treatment. Further, I am of opinion that patients are much more likely to maintain regular attendance when given injections than when oral therapy is the method of choice. I examined all the cases and found quite a large number were arrested or inactive cases. I was interested in the fact that over 30% of the cases were lepromatous, among which there were a fair proportion of advanced reacting cases. As these cases came from the locality, it would appear the disease may be serious and possibly on the increase. It would be interesting to do an intensive survey in this area, in order to ascertain the state of the epidemic of leprosy in this district.

From Likwenu we went on to Utale. This institution is rather inaccessible, being 14 miles from the main road and approached only by a bush track. During the rains the mission station is almost completely cut off from the main road. The leprosy institution is well conducted, clean and neat, and houses are excellent. Oral DDS was given, but the stock was temporarily exhausted. This, perhaps, was a blessing in disguise, as daily dosages were being given, and the Sisters were somewhat alarmed because of the number of serious reactions and occasional toxic signs. I was struck by a number of very severe lepromatous cases. There were several cases of acute laryngeal leprosy, which is, apparently, relatively rare in East and Central Africa, and one case of acute reacting tuberculoid leprosy. The tuberculoid leprosy here is mostly of rather a chronic, torpid, type, and the reacting type of case frequently seen in India is much less common. Medical supervision in this institution is badly needed, and I felt that parenteral sulphetrone would be safer where there are so many advanced lepromatous cases, and where there is no medical officer in charge, and medical supervision is limited. There was no microscope in the institution, and sulphone therapy was given according to rule of thumb.

A visit to this institution and to Likwenu emphasises the need for closer medical supervision. It is just here where a visiting leprologist would be of considerable help, and I shall be making recommendations in this connection at the close of this report.

From Utale we proceeded to Dedza, where we stayed with Dr. Whitfield, the District Medical Officer. Despite heavy rain during the night Dr. Whitfield, accompanied by Mrs. Whitfield, took me down the escarpment to visit the Roman Catholic Leprosy Institution of Mua. This institution is near the Lake shore, and in an area of relatively high leprosy incidence, and is visited regularly by the Medical Officer at Dedza. In view of the heavy rain and threatening further heavy showers, our stay at Mua Mission had to be curtailed. In addition to the leprosy settlement there is general

work, with a large outpatient department. The leprosy settlement was neat and tidy and DDS therapy was being used in smaller, and, therefore, safer dosages. The patients are housed both in well built brick houses and in mud and wattle huts. The latter seem to be reserved for married couples. Full advantage of the ground does not seem to be taken, for while patients grow food on individual shambas there is no communal farming, and there is a tendency to increase money crops, e.g. cotton, to the detriment of food crops. When finances are limited the decision as to the best division of ground between these crops is always difficult. It would be well, I believe, to introduce communal farming and insist on a number of compulsory hours of work in the week, so that those who are disabled and cannot farm are provided with food from settlement shambas.

In many institutions in East and Central Africa the number of healthy children is high. I was surprised to find so many children, in whom there is no sign of leprosy, in this settlement. I was told separation was impossible. This is a serious problem, and if marriage is allowed facilities for accommodating the babies in a creche should be provided. I have already laid down directives with reference to marriage and healthy children in settlements and segregation units.

I left Dedza on December 1st at about 7.45 a.m. and stopped for a short time at Lilongwe, where I met Dr. Mitchell and Dr. Eberlie, and then proceeded to Kocira, the site of the new leprosy institution now being organised and built by a B.E.L.R.A. worker, Mr. Coffin. The site chosen for the Government Leprosy Institution is an excellent one, and was selected largely because it was the only one available in the Central Province that provided sufficient land for the accommodation of 1,000 patients, as recommended by Dr. Ross Innes. The drawback that this institution is some distance away from the area of high endemicity of leprosy, is somewhat counterbalanced by the fact that there is plenty of evidence to show that if an institution is well run leprosy patients will travel great distances to secure accommodation and treatment. Another disadvantage is that, when Federation is completed, then all the leprosy institutions will be concentrated in the North. There will be three institutions within 50 miles of Kocira—Mwami and Nsadzu in N. Rhodesia, near Fort Jameson, and Kocira in Nyasaland—and only one institution in the South, Malamulo, and one institution, Mua, near the Lake shore. Considerable interest is being taken in this new institution at Kocira. There is ample land available, and once staff has been recruited, and the patients admitted, there are good prospects for its future development.

While at Kocira I took the opportunity to visit Mwami, the Seventh Day Adventist institution near Fort Jameson, in Northern Rhodesia. I returned from Kocira on December 2nd, and stopped the night at Lilongwe with Dr. Eberlie, whom I found interested in leprosy. The next morning I visited the African hospital and saw two cases of leprosy and demonstrated staining technique to the laboratory assistant. I arrived back at Zomba on the evening of December 3rd.

On December 4th I spent a considerable amount of time discussing the leprosy problem as it applies to the Protectorate of Nyasaland, and Dr. Mackenzie was good enough to give me the whole morning for these discussions. We went over a number of matters such as organisation of institutions, treatment, outpatient work, criteria of discharge, etc.

Nyasaland has recently had the good fortune of a legacy of £250,000. The funds available to the Brown Memorial Trust total approximately £250,000, of which a proportion only may be disbursed initially in capital grants, the remainder of the sum is being invested and the income used by the Trust. While it has not been decided what sum will be given to Kocira, the amount will be substantial. It is accepted that, leprosy being one of the endemic diseases of the country, it is the duty of the State to organise measures for the treatment and prevention of leprosy, giving that amount of attention to the subject in proportion to its seriousness as one of the endemic diseases of the country. Special funds, however, should be used with two objectives in mind. The use of these funds should (1) add to our sum total knowledge of the disease, and (2) hasten the day when leprosy is brought under control.

An urgent necessity in Nyasaland is an adequate appraisal of the situation and a plan of campaign, with the new Kocira Institution as the centre from which the whole campaign can be directed. In a short visit of fourteen days it is not possible to lay down directives for the development of a comprehensive leprosy campaign. There is no question that it is essential to appoint one officer to act as Leprosy Control Officer, through whom all plans for the development and control of leprosy should pass. It is difficult to secure an officer of sufficient experience, and, therefore, there seem to be three possible methods of approach.

1. Secure a local medical officer, who is interested in leprosy.
2. Give him the necessary training.
3. Ask him to take over Kocira Leprosy Institution, and gradually develop the Leprosy Campaign.

In this connection, the matter of training is always difficult. As an initial step W.H.O. or some other organisation might be asked to send out an expert for 2—3 months, whose main work would be to give a preliminary training to such a medical officer as suggested, and to lay down the broad principles of leprosy control. After such a preliminary training the officer who has been appointed as Specialist Officer for Nyasaland might be stationed at Kocira and develop, gradually, the Leprosy Campaign for the whole of the Protectorate. At a later date, when this officer has gained special experience, he might be sent to India, and elsewhere, so that he could gain an insight into the problems of the disease in other countries. If an officer were appointed, it seems to me better to follow the example of Northern Rhodesia, and nominate a senior officer in the Service. There are, unfortunately, as far as I know at present, no leprologists available, and in this case it would appear to me better to ask for volunteers from senior officers in the Medical Department, and appoint a Specialist (Leprologist) from among these, unless a Specialist with previous leprosy experience can be recruited. If this were done the Officer would have two favourable qualifications. Firstly, he would have the seniority necessary for such an appointment, and, secondly, he would have considerable experience of the people and country. The Northern Rhodesia Government have appointed as Leprologist-designate, an individual, who is of the Principal Medical Officer grade.

In view of the possibility of the Central African Federation finally eventuating, it might be well to bear in mind that it should not be impossible for a leprologist to be able to advise both Territories—viz. Nyasaland and Northern Rhodesia. The fact remains, however, that until a Leprosy Service is organised in this Protectorate the development of an adequate campaign will be delayed, and the day when leprosy comes under control indefinitely postponed. Today, when so much can be done for the leprosy patient, not only from the point of view of specific treatment, but to assist in his rehabilitation as a useful citizen, it behoves the medical profession, and particularly the Administration, to place leprosy in its proper perspective in relation to its importance as an endemic disease. The time for an advance in controlling this disease seems to be particularly ripe when one realises the publicity and interest the recent bequest of £250,000 has aroused.

I would like to express my deep sense of appreciation of the interest and support of the Director of Medical Services and the whole Medical Service in my recent visit, for I was enabled to see a great deal of the work despite the shortness of my visit.

NORTHERN RHODESIA

I left Salisbury at 7 a.m. on 7.12.52 and arrived at Lusaka about 9.20 a.m. and was met by Dr. Evans of the Medical Department and Dr. Garrod, the Leprologist-designate. I was able to have preliminary discussions with Dr. Evans and Dr. Garrod. On 9th December I left with Dr. Garrod to visit Cikankata, where the Salvation Army have a Leprosy Institution in connection with their general hospital work. Dr. Gauntlett, the Medical Officer, was obviously keen and anxious to do everything possible to develop and extend the work. Another doctor is needed if this work is to develop adequately. It is gratifying to learn that such an appointment has been made and the second doctor will shortly arrive. I would strongly recommend that as much attention as possible be given to the Leprosy Institution, for it represents an excellent example of leprosy work in co-operation with a general hospital.

I am doubtful of the wisdom of extending Cikankata for two reasons. (1) The hospital is in an area where there is much European settlement, and it does not seem a sound policy to develop a large central leprosarium under such conditions. (2) The local African Chiefs are not particularly co-operative. If, therefore, local opinion has to be overcome, and assistance is difficult to secure, the chances of success of a large institution are not good, and it would be better, in my opinion, to continue the present work and endeavour to make it more adequate.

From Cikankata we motored to Mazabuka, where the G.M.O. (Government Medical Officer) Dr. Dublon, had a small leprosy unit attached to the hospital. There were 25 cases under isolation. Oral Dapsone was the method of treatment, and the dosages tended to be too high (300 mgms. daily). There apparently had been one death, but I was a little doubtful whether patients were taking their tablets regularly, for the clinical improvement did not appear to be commensurate with the dose that was given. It was suggested that Dapsone (D.D.S.) should be given bi-weekly and a close check made to see that the patients actually swallowed the tablets. After tea at Dr. Dublon's house, Dr. Garrod and I left for Monze, where we spent the night. I was glad to have the opportunity of discussing matters in some detail with Dr. Garrod. The decision to appoint a senior officer of the Medical Service as Leprologist appears to be a wise one.

After spending the night at Monze we left for Chikuni, a Roman Catholic Centre, where the patients come as out-patients. The

District Commissioner, Mr. Bourne, whose headquarters are at Gwembe, has organised a local segregation scheme in co-operation with the District Chiefs, who are most enthusiastic. The patients in this Segregation Settlement go over to Chikuni for treatment, and when we arrived all but three made their way across for us to see them. Chikuni is only a few miles from this isolation village. The settlement housed some 50 patients in ordinary African huts and was neat and tidy. Of the three patients who were unable to go to Chikuni, one was unwell with signs of mild hepatitis, the second was an old man, and the third a recent admission. I was very surprised to find that the patients had been given DDS tablets to take away with them, and we collected a matchbox full of tablets from one patient! This emphasises the need for closer supervision, for there were enough tablets in the segregation unit to cause serious ill health, if not death.

We returned to Chikuni and I examined 120 cases. Quite a number needed no further treatment. We laid down instructions for twice weekly DDS. The Sister mentioned that the patients insisted on injections, and, that being so, we indicated it would then be better to give aqueous sulphetrone, especially for those cases not in the segregation village. The African dresser should be made responsible for the supervision of tablets for those patients who could not come twice a week; or, alternatively, patients could be given a once a week treatment, taking 4–6 months to reach a maximum of 500 mgms.

This work indicates the possibility, where there is a keen District Officer, and co-operative Chiefs, of organising local segregation units, and, if these are linked up with the G.M.O's. work, then the expense of a large inpatients' institution could be avoided. There must be central and district leprosaria, but, combined with these, there should be local segregation units organised along similar lines to this one, admitting, if necessary cases with acute complications into the local hospital. Every Government hospital should be prepared to admit leprosy patients for temporary treatment. This principle has been accepted and implemented by the Northern Rhodesia Government, and is strongly supported by the D.M.S. This, therefore, means that local segregation units if established, will always have the co-operation of the nearest general hospital. This forward policy of the Government will give much encouragement to those who are undertaking leprosy work, but have no hospital facilities for treating acute emergencies or concurrent disease arising in the course of leprosy.

I returned to Lusaka, and in the evening had discussions on the general principles of leprosy control with Dr. Garrod. On the

question of the choice of a central Government leprosarium it was suggested that the following principles should apply. Such an institution should be:—

1. Reasonably accessible to Lusaka for teaching and training facilities. By accessibility is meant good air, train or road communication.
2. In an area where the local Africans, especially the Chiefs, are ready and willing to co-operate.
3. In an area of relatively high endemicity.
4. In an area in which experimental field units can be organised.
5. In an area where there is a reasonable possibility of acquiring good agricultural land.
6. In an area where it is possible to do follow-up work, especially in connection with child contacts.

Before a final decision is taken with regard to this, it would appear to be a wise decision to post the Leprologist-designate to Luapula, seven miles from Mbereshi, as a preliminary headquarters. Here there is an L.M.S. Hospital, which I am sure would co-operate. There is also an all-weather road to Ndola, which has excellent air communications, not only with the rest of Northern Rhodesia, but with connections to East and West Africa and to Europe. Other advantages are that this area has a relatively high endemicity, with densely populated villages which occupy a narrow strip of land along the river. Within a fairly short time it will be possible to fly within a few miles of the centre. There is already a leprosy institution here, with two lay workers, and possibility of development. The following buildings have already been erected—patients' houses, office for two workers, medical and general office, two carpenters' shops, three houses—one, however needs extensive repairs—one guest house. In addition to this there is ample land available. Diet is poor, and meat not available. The tsetse fly belt is within a few miles, but this land could be cleared and sheep and goats reared for meat, as these are not affected by fly. As the institution developed, fly would recede and other animals could be reared. Another great advantage is that the local Chiefs and inhabitants are co-operative.

I further discussed with Dr. Garrod and Dr. Evans the initial duties of the leprologist, and the following points might be considered with regard to the final conditions of his appointment.

1. In conversation and correspondence with the Director of Medical Service, it is good to know that such a step is already actively under consideration, and that Dr. Garrod is to be appointed

with the rank of specialist, and will be 'the Territorial Leprologist for Northern Rhodesia.' The Leprosy Service is to be planned along the same principles as are at present in the specialist branches of Tuberculous and Venereal Diseases. The set-up for leprosy therefore makes it possible for Dr. Garrod as head of the Leprosy Division to organise the campaign effectively. The specialist in leprosy is directly responsible to the D.M.S., and thus the whole service will be integrated into the Medical and Health Services of the whole territory.

2. The Leprologist should not be solely administrative. He should be in over-all charge of a Central Institution, acquiring practical experience of his own.
3. While surveys must be undertaken, he should not be solely a field officer; his survey work should be confined to 3-4 months each year.
4. The Leprologist must be in a position to help and advise other institutions. Thus he must have, or acquire, experience in clinical, operative, research and preventive aspects of leprosy. This means that, prior to the final appointment, Dr. Garrod should be sent on a study course. I would recommend that (a) He be appointed a delegate to the International Leprosy Congress in Madrid, meeting early in October. (b) Prior to this he could spend some time in England, when he would get an insight into the more difficult aspects of leprosy therapy. (c) After Madrid I suggest he visits India and I would be glad to outline a tour for this purpose; he could either go to India from Nairobi, or fly from Europe to India and return to Nairobi. (d) When in East Africa he should get into touch with Dr. Ross Innes. (e) At a later date, when he has acquired greater experience, a further period of study, covering West Africa, North America (Carville) and South America, would be most profitable.

With regard to the territory covered, Dr. Garrod is at present responsible for Northern Rhodesia, but the closest co-operation should be maintained with Nyasaland, and the two Governments, by friendly consultation, might ultimately work out a common policy. Money has been given for a leprosy survey for both territories, and it seems to me a sound policy to extend this over at least a 5-year period and ask the Leprologist for Northern Rhodesia to organise the survey and supervise the details.

While in Lusaka, I saw the few leprosy cases isolated in the vicinity of the Government Hospital. Lusaka is not a satisfactory area for permanent isolation, and I feel that this segregation unit

should be looked upon as a transit camp. Non-infectious cases should be treated as outpatients and infective cases sent to the nearest leprosy institution. Cases needing temporary medical or surgical treatment should be admitted to hospital, and those permanently deformed, and arrested cases, sent back to their villages or to an annexe of one of the Missions' homes where they have facilities for the care of the disabled patient, who cannot be absorbed into the community.

With regard to treatment, I have already laid down the general principals of treatment and only need to mention that the routine treatment should be twice weekly Dapsone. Where supervision is difficult and it is impossible to ensure adequate oral treatment, then parenteral sulphetrone (50% aqueous solution) should be the alternative. Adequate stocks of Dapsone (Avlosulphone—I.C.I.) and Sulphetrone granules (B.W. & Co.) should always be on hand.

On December 12th the Government kindly chartered a plane which took me to Mongu. This is Dr. Garrod's headquarters, as P.M.O. of this district. The weather was poor and the journey not without its exciting moments!

We stopped over at Mongu for lunch and saw Dr. Garrod's small leprosy unit attached to his General Hospital. A Nursing Sister, who is also the Theatre Sister, supervises some 130 cases. In addition to this some 120 cases are attending mission camps in the vicinity. The general plan is an excellent one. Patients are first admitted to the Government hospital unit, and stabilised on sulphone therapy and then sent to the missions, where the medical work is not up to the same standard, as there are no resident doctors.

From Mongu we then flew to Balovale and Dr. Le Grange, the G.M.O., kindly motored us to Chitokoloki. I should mention that Dr. Beardsley, of Mwami, accompanied us on this trip. The organisation at Chitokoloki is extremely good. There is the main leprosarium where active cases are treated— here there are good hospital facilities and a laboratory where leprosy tissue can be prepared up to the stage before embedding, and where a considerable amount of biopsy work has already been done. There are approximately 250 cases in Chitokoloki. In addition there are four satellite settlements. These are in reality after-care colonies, where patients can be better supervised and yet live a natural village life. Where possible discharged patients should be sent back to their homes, but when that is impossible this is an excellent method, and in reality is a "Papworth Colony" for ex-leprosy patients. Land is given to the patient, and after the first year he is expected to support himself as he would in an ordinary village.

There are four of these re-settlement areas. There is a great opportunity here for a well planned experiment on long term sulphone results. It would be interesting to continue half the healed and discharged lepromatous cases on a maintenance dose of Dapsone, and give the other half a placebo in the form of 100 mgms. tablets of calcium lactate and see how far, over a period of five to ten years, relapses occur. It is accepted, of course, that active treatment would be given to all cases for one year after their first negative smear and the experiment would start from that period. A comprehensive immunological investigation could also be undertaken.

It is gratifying to have the information that Chitokoloki is to be the regional leprosarium of this district. Another mission institution in charge of a Nursing Sister has been established at Kabulamena. Such an institution, and others that may be commenced by missions, should be looked upon as subsidiary ones or auxiliary units, and should be under the over-all charge of Dr. Worsfold. All active cases should be sent to Chitokoloki. Those cases which have been stabilised on sulphones and are not likely to be difficult to treat, should be treated at these smaller institutions with, as I say, general supervision from Dr. Worsfold. I was most impressed with the work, and Dr. Worsfold is deserving of all support and encouragement.

I returned to Lusaka on December 12th, arriving at 12.30 p.m. The journey again had its exciting moments, and we passed through very heavy rain.

Before closing this report I should mention that I took the opportunity, when visiting Kocira in Nyasaland, to motor over to Mwami, and to Fort Jameson. I had a short interview with the P.M.O., at Fort Jameson and then went to Mwami with Dr. Beardsley, who is the doctor in charge of the leprosy settlement of the Seventh Day Adventist Mission there, and who accompanied me later to Chitokoloki. While, as is often the case, there is relatively little leprosy on the escarpment, it is said that the incidence is considerably higher in the valley, where there is a mission of the Dutch Reformed Church (S. Africa) and a leprosy institution at Nsadzú in charge of a missionary Nursing Sister. Unfortunately, I was unable to visit this latter institution. As at Malamulu, so here, many cases came from long distances, for this institution is well known for miles round. It thus illustrates again the fact that, provided an institution is well organised and the patients have confidence in those who are treating them, a leprosarium will attract patients from all over the territory, and even beyond its

borders. There were 293 cases, with a high percentage of the lepromatous type.

I spent some time discussing matters with Dr. Beardsley, demonstrating bacteriological technique, and suggested to him the cases that were either arrested or healed and could be discharged. There is a General Hospital attached to the Settlement, belonging to the same mission (Seventh Day Adventist). Dr. Beardsley is quite prepared to admit cases into this hospital for acute medical or surgical treatment. Therefore, apart from a sick bay there is no need for a special hospital for the leprosy institution. The Nursing Sister in charge is keen, and potentially this institution has great possibilities. It is hoped that more medical staff will be available, so that the two institutions—the hospital and the leprosy settlement—can be organised as one unit. The laboratory is gradually developing and is now able to cope with ordinary work, and I am sure that still more effective work will be done in the future.

The institution at Mwami, already doing excellent work, should be looked upon as the central leprosarium for the district, and cases that are difficult to treat, or need special treatment, should be referred to it. Nsadzu should be a subsidiary institution, and be used for the isolation and/or treatment of cases who are more easy to treat, and for advanced cases who cannot be re-absorbed into the community.

December 13th was spent in discussions with the Director of Medical Services and the Minister for Health and Self-Government for Northern Rhodesia. The discussions and conversations can be summarised by itemising the points which arose.

1. Leprosy is well within the possibility of control (a) if linked to treatment, and the selective principle is applied to admissions as well as discharges, (b) If village segregation units can be encouraged.
2. A survey should not be a whole-time job, but part of an overall leprosy policy, covering a period of several years.
3. There should be regional leprosaria where treatment of a detailed nature can be provided. After stabilisation cases should be sent to village and other settlements. The nucleus of such work appears to lie in the institutions under Dr. Worsfold, Dr. Gauntlett and Dr. Beardsley.
4. Government hospitals should be the pivots of a leprosy campaign in areas of low prevalence.
5. DDS is the most suitable basic treatment, with parenteral sulphetrone as an alternative, particularly where the medical staff is inadequate for close supervision.

6. Rehabilitation centres should be developed.
7. A Leprosy Control Officer, specialist grade, should establish temporary headquarters at Luapula Valley, and should tour for six months of the year—but not continuously.
8. Dr. Garrod might with advantage tour India,—Bombay, Hyderabad, Vellore, Madras, Calcutta
9. Leprosy work should be linked with other specialist work, in particular, orthopaedic surgery.
10. General hospitals should admit leprosy cases if any acute condition demands it.
11. Leprosy Officers might be appointed for Nyasaland and Northern Rhodesia, with over-all supervision by one Leprosy Control Officer.
12. Propaganda and educational training and the development of leprosy control, should, as a whole, be integrated with the work of the general medical services.

At the close of these discussions Dr. Robinson very kindly expressed in generous terms the gratitude of his Government and appreciation that the Medical Secretary of the British Empire Leprosy Relief Association was able to come out and discuss matters, and was most grateful for the assistance I had rendered.

While in Lusaka I met the pathologist and had a long talk with Dr. Briggs, the Tuberculosis Officer. Dr. Briggs will be a most helpful colleague in the planning of epidemiological and immunological studies, for the problems of tuberculosis are sufficiently allied to those of leprosy for co-operation in this work to be of the very greatest assistance. I found the Government pathologists and others very desirous of helping whenever possible.

The time is ripe for a forward policy, both in Northern Rhodesia and in Nyasaland, and the Northern Rhodesian Government are fortunate in having an experienced officer willing to specialise in leprosy. With the present eminently balanced outlook, with the determination to build on sound lines and not to be rushed, there is every prospect of the development of a comprehensive leprosy programme, which will achieve its objective—the control of leprosy in the territory.

Nyasaland and Northern Rhodesia have similar problems, and it augurs well for the future that there is the closest co-operation between the two territories, and that the heads of the Medical Departments in both countries are enthusiastically supporting forward moves in the development of leprosy control.

In closing this report on Northern Rhodesia, I should like to express my appreciation of the work the missions have played in leprosy in this territory. They have borne the main burden, and now that Government finds itself in a position to co-ordinate the drive against leprosy, the missions have gladly and wholeheartedly offered their co-operation and will play an essential part in this important work. I would like to express my sense of deep gratitude and indebtedness to the whole Medical Department, led by Dr. Robinson who is keen that leprosy should have its rightful place in the over-all Public Health programme. The Government showed their keenness by chartering a plane to Balovale from where, through the kindness of Dr. Le Grange, I was able to reach Chitokoloki despite torrential rains. I also had the opportunity of discussing treatment matters with Dr. Briggs, the Tuberculosis Specialist, and with the Government Pathologist. This contact will be most helpful as the leprosy campaign develops.

SOUTHERN RHODESIA

Owing to the fact that I was passing through Salisbury en route for Lusaka, I took the opportunity of visiting Ngomahuru again. Dr. Morris, the Secretary for Health for Southern Rhodesia very kindly arranged transport for me, and I was met at the plane on arrival and motored at once the 200 miles to Ngomahuru near Fort Victoria, arriving about 8.30 p.m. that same night.

I was extremely glad of this opportunity to revisit Ngomahuru, it was twenty-three years since my last visit and at that time the institution was in its infancy. The change since my first visit has been very great. I consider that this institution is a model of its kind and should be developed in every way possible as a Central Teaching Institution for the new Federation of Southern Rhodesia, Northern Rhodesia, and Nyasaland. The credit for the development of this leprosarium goes not only to the far-sighted policy of the Health Department, but to Dr. Mostert whose excellent work and inspiring leadership has made these developments possible.

On the morning of December 8th I was shown quickly round the institution, and then spent several hours seeing cases and discussing clinical problems. I was particularly pleased to meet Dr.

Allen, who not only is keen, but is interested in histopathology. I was able to take several photographs and Dr. Mostert and Dr. Allen kindly said they would send me material from these cases. This biopsy material arrived later in London, and reports have been sent with copies of the slides. I was extremely gratified to see the records and methods of assessing cases, and I consider Ngomahuru an institution which is well equipped for clinical and therapeutic trials. I am hoping to be kept in touch with developments, and look forward to co-operation and collaboration with these workers. This institution has great potentialities.

I would express my personal gratitude to Dr. Mostert for enabling me to get a rapid insight into his problems, and to the Southern Rhodesian Government for their courtesy in making this visit possible.

Now that federation is an accepted fact, and because Nyasaland and Northern Rhodesia both have progressive leprosy policies, the time has come to integrate the leprosy campaign in this federation, and Ngomohuru has great claim to be the Central Training Institution for these territories, and any assistance towards the completion of a comprehensive anti-leprosy campaign centering on Ngomahuru as the Central Training and Research Institute will, I am sure, have the whole-hearted support of BELRA, and I shall watch with great interest and expectancy the future development of leprosy in these territories.

*

My tour through East and Central Africa was very stimulating, instructive and profitable, and to all who made this tour a success I express my deep sense of appreciation and gratitude.

THE LEPROTIC CHILD IN AFRICA

JAMES ROSS INNES, M.D., D.T.M.

(A paper read at the Conference on the African Child, held at Nairobi, January 1953, under the auspices of the Standing Committee for Medical Research in East Africa and published by permission.)

INTRODUCTION.

Leprosy surveys carried out by the author from 1946 to 1951 in East Africa, of which the main findings have been reported elsewhere (Ref. 1 to 12), give much data for the study of the child sufferer from leprosy. From records of these surveys it is proposed to make a study of epidemiological nature of 1,492 cases of child leprosy which were found in the natural or untreated state amongst a total of 7,072 cases of leprosy of all ages.

For the purpose of this paper, the term "child" will be taken to include all persons of 14 years of age and under.

The countries in which these 1,492 child cases were found comprise Kenya, Tanganyika, Zanzibar and Pemba, Uganda, Northern Rhodesia and Nyasaland. Nearly every African tribe resident in these countries is represented amongst these leprotic children. It must be understood that the body of child cases dealt with is non-institutional in origin, and that they do not come from existing leprosaria. They come from the homes and villages of the people, and at the time of discovery were living in the same conditions as their non-leprotic brethren.

It is not proposed to make an exhaustive study. The main object of this paper is to present a picture of the African child in relation to leprosy, and to show that the African child is at the very heart of the leprosy problem in these parts of Africa.

SECTION 1. *The child case rate.*

These 1,492 children occurred as part of a total of 7,072 cases of leprosy of all ages, which emerges as *a child rate of 21 per cent.*

This figure represents the averages for a very wide area, but confirmation deriving from other work of local scope comes from the survey of WHEATE (1951) Ref. 13, in the Teso District of Uganda, where he encountered a child rate of 22.5 per cent.

The significance of a child leprosy rate of over 20 per cent. hardly needs pressing. The disease of leprosy must be a living and continuing entity amongst the people. To put it another way, if not a single case of child leprosy had been found, one would have been looking confidently to the disease being about to die out.

SECTION 2. *The sex incidence.*

LOWE (1934) Ref. 14, made a valuable review of the literature on the sex incidence of leprosy, and came to the conclusion that the number of males is to females as 2 to 1.

As regards children, COCHRANE (1947) Ref. 15, states that in Saidapet in Madras, male children were to females as 77 to 68, and considers that in child leprosy the disparity between the sexes is lost. This is not quite borne out by our present study, for of the 1,492 children, males were 867 and females 625, which is a male preponderance of roughly 4 to 3.

The male preponderance seems therefore mildly to persist, even in child leprosy.

The full explanation of the difference in the sex incidence of leprosy is not yet available. DE SOUZA CAMPOS and DE SOUZA LIMA (1950) Ref. 16, in their monograph "Lepra na Infancia" mention the action of the sex hormones as one of the possible explanations for the accepted sex differentiation of 2 to 1, and they also found a lesser disproportion among children, namely 52 per cent. of males and 48 per cent. of females; they believe that this slighter difference is based on "the sexual neutrality" of childhood.

This explanation based on the greater vital force of females in resisting the acquisition of leprosy is at least plausible. To this the author would add that he has observed in his surveys that girls were usually cleaner than boys. Poor personal and clothes cleanliness might very well play a part in the acquisition of a disease which makes a certain part of its attack via the skin.

SECTION 3. *Age incidence.*

Of the 1,492 cases, ages in years were as follows . . .

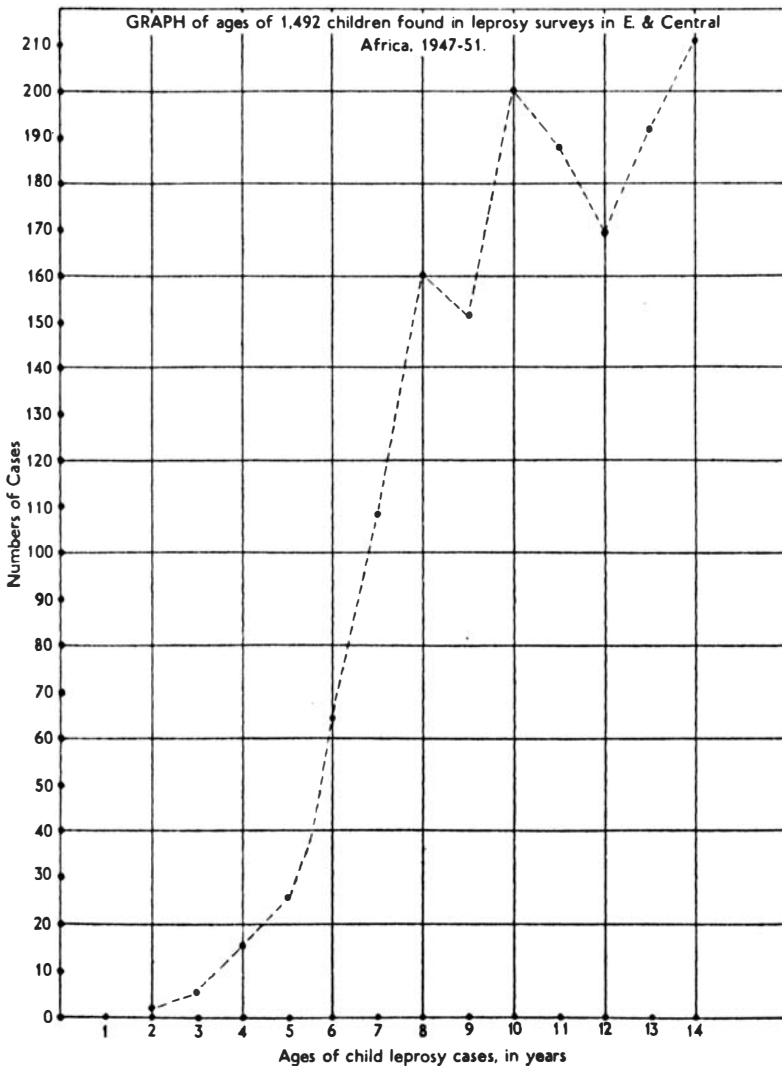
ages	14	13	12	11	10	9	8	7	6	5	4	3	2
number	210	192	170	189	201	154	160	106	64	25	15	5	1

These figures, presented in the form of a graph, q.v., show a very marked inrush of cases between the ages of 5 and 14 years. In this respect, it is interesting to note the finding of LOWE (1938) Ref. 17, from Bengal, where he says that "the years between 3 and 30 are the most likely for the signs of the disease to appear, and that the maximum appears to be between 5 and 15."

It must be noted that there is a *latent period* in leprosy of 2 to 5 years' duration, existing between the point where the disease was first acquired and the first presentation of the detectable signs of the disease. Following out this thought, it will be seen that it is a fair deduction that the one child case in particular who was 2 years of age when seen, and who rather astonishingly was a female and a lepromatous case, might well have sustained the infection at birth,

and that a considerable proportion of the cases must have sustained their infections at a very tender age.

There is general agreement now that by an overwhelming preponderance, *leprosy is sustained in childhood and youth*. COCHRANE (1947) Ref. 18, goes so far as to say that "leprosy cannot be maintained in the community in the absence of child infection," and most agree with this. If we insure that children are removed from all contact with infectious leprosy cases, we can lay the foundation for a complete abolition of the disease. We have ever to think of leprosy as a problem based in the environment and living conditions of children and the young.



SECTION 4. *The clinical type of the child leprosy.*

Using the Havana Classification of Leprosy (1948) Ref. 19, it is proposed now to compare the clinical types of all the cases of leprosy with the clinical types in the children, as in the following table.

	Lepromatous cases	Tuberculoid cases	Indeterminate cases	Polyneuritic manifestations, occurring alone or as complication of the main types
7072 of all ages ...	1416 (20%)	4387 (62%)	1269 (18%)	1910 (27%)
1492 children only ...	315 (21%)	1090 (73%)	87 (6%)	46 (3%)

Comparing the two pictures, it will be seen that . . .

- (a) there is little difference in the lepromatous rate between children and the whole;
- (b) tuberculoid cases in children are somewhat greater in number;
- (c) indeterminate cases in children are few; in African children this poised state seems to be left to be experienced only when childhood is passed, and the child's leprosy career seems to begin either as a frank tuberculoid or a frank lepromatous manifestation;
- (d) polyneuritic lesions, whether alone or complicating the main types, are very considerably less in these children; such lesions in their more obvious forms also seem to constitute an experience reserved for later career in leprosy; such polyneuritic lesions as were noted in these children were all at ages 10 to 14 years.

SECTION 5. *How did the children acquire their leprosy?*

It is best to divide this question into three parts, namely *where? from whom?* and, *under what conditions of living?* (a) *Where?* Did they acquire it in the field, in the market-place, in travel, by one contact or a few momentary contacts? The answer is decidedly in the negative. There was not one case where this sort of infecting contact could be incriminated.

Did they acquire it in the process of living in a house or under some roof, where they were brought into daily, and more especially, nightly contact with others? The answer was found to be very clearly in the affirmative.

(b) *From whom?* The existence of an original infecting case has been shown in the great majority. Even in the apparent absence of any news of such a case, it was found that more enquiries would turn one up, sooner or later.

Analysing the sources found, the infecting case or cases were adult in 93 per cent. of instances, and another child in only 7 per cent. Of the adult infectors, 67 per cent. were parents, and 33 per cent. were more or less close relatives, or family "hangers-on."

Instances of family groups of leprosy were common, ranging from the extreme example of mother and four children, to that of parent and one child, or uncle or aunt and one child.

Looking at the situation from the other side, in the general surveys it was found that only 5 per cent. of all leprosy cases genuinely lived alone, i.e., segregated. Of the rest, the average was *three children living in home contact with each adult case of leprosy*.

(c) *Under what living conditions?*

The living conditions of the children presented certain invariable features, namely . . .

overcrowding, or too many people inside the hut at night in relation to the cubic space;

darkness, by day, inside the dwelling;

humidity, because in ill-ventilated crowded huts the vapour pressure rises and remains high, especially at night;

dietetic errors and deficiencies were a very common background to living in the case of these children; a great lack of first class biological protein is the commonest fault in diet;

debilitating diseases in a vast selection dogged most of these children, which diseases must have paved the way to the sustaining of leprosy infection; examples are hookworm, yaws, nutritional anaemias.

chronic skin diseases, such as are associated with scratching and breaches of the body surface, may have provided local portals of entry for the leprosy germ; examples are chronic scabies and the ringworms;

deficient bodily cleanliness and clothes cleanliness was very common, and must also play some part in the acquisition of leprosy.

The living conditions above listed are commonly recognised to have relation to leprosy. Spacious and well-lighted houses, correct and adequate food, hygiene and cleanliness, and freedom from the load of debilitating diseases, would go a long way to prevent the passage of leprosy, even to the ever-susceptible young.

SECTION 6. *These children having acquired leprosy, what is their fate?*

In the first place, the existence of *evanescent leprosy* must be recognised in children. Thus COCHRANE (1947) Ref. 20, describes 249 children under observation without treatment for 7 years, in whom about 62 cases had disappearance of all lesions of leprosy.

RODRIGUEZ (1926) Ref. 21, pointed out also the evanescent nature of some lesions of children. MUIR (1936) Ref. 22, confirmed this by observations over many years. There is therefore little doubt that of all the children seen in the African leprosy surveys under present review, some have evanescent lesions subject to self-cure. The proportion can only be estimated, and the author's assessment is that one sixteenth of the total number might come under this category.

This should not blind us to the hard fact that a very great proportion of the children are destined to progress in their leprosy, and in the absence of remedial intervention, are doomed to become adult cases and the infectors of others in course of time. It cannot be forgotten that very many of these child cases were established cases of leprosy when first seen, out of the reach of any possible factor of evanescence. Such were, for example, the 315 lepromatous cases noted in the table in Section 4, or the 46 polyneuritic cases, or nearly 1,000 of the tuberculoid and indeterminate cases.

It should be recalled that in the modern therapy of leprosy, children are especially responsive, and that a high rate of arrest of the disease can be expected in them. The problem resolves itself into the bringing of all child cases of leprosy under observation and care, and that again resolves itself into the determination and financial ability of the country in which they occur.

So far, in East and Central Africa, there is not enough accommodation and care available for all the cases of leprosy which exist, and in the default of same, one suggests that a concentration on child leprosy would be an economic step, one of the most rewarding of the many attacks that could be made on the leprosy problem. Hand in hand with special attention to lepromatous leprosy at all ages, if one at all times "went after" the children, control and eradication of the disease would be in sight.

SUMMARY.

By a study of data obtained in extensive leprosy surveys in East and Central Africa, 1947-1951, in which 1,492 cases of child leprosy were found, certain facts and inferences have emerged . . .

1. A child case rate of 21% was found, and is taken to mean that leprosy is a living and growing entity in these countries.
2. The sex incidence was found to be 4:3, with males preponderating, and the suggestion is made that this may be due to females having more vital endowment, and being cleaner.
3. The age incidence of the child leprosy is recorded in a table

and graph, and it is pointed out that between 5 and 14 years there is a great inrush of cases, and that a great proportion must have sustained their infection at a tender age, and that, generally speaking, leprosy is acquired in childhood and youth. It is inferred that leprosy is mainly a problem based in the environment and living conditions of children and the young.

4. The clinical types of the child leprosy are recorded in a table making also comparison with the leprosy at all ages. The relative infrequency emerges of indeterminate and polyneuritic types in African children.
5. How the children acquired their leprosy is recorded. For the most part, it was by living in poor hygienic conditions in contact with adult cases of leprosy. The importance of protection of children from leprosy infection is indicated as an important key to the abolition of leprosy from a people.
6. The fate of the children who acquired leprosy is discussed. In spite of the existence of evanescent leprosy of childhood, a great proportion of the children would progress in their leprosy and become infectors of others. The lack of adequate accommodation in these countries for all existing cases of leprosy is indicated, but special attention to children is recommended as one of the most economic and fruitful forms of attack on the leprosy problem.

LIST OF REFERENCES.

1. INNES, J. R., Leprosy in Uganda. *East African Med. J.* **25** (1948), 379-381.
2. *Ibid.* Leprosy in Kenya. *Ibid.* **26** (1949), 32-35.
3. *Ibid.* Leprosy in Tanganyika. *Ibid.* **26** (1949), 202-203.
4. *Ibid.* Leprosy in Tanganyika, Lake Prov. *Ibid.* **26** (1949), 199-201.
5. *Ibid.* Leprosy in Tanganyika, S. Highlands Province. *Ibid.* **26** (1949), 212-215.
6. *Ibid.* Leprosy and Leprosy Work in East Africa. *Internat. J. of Leprosy.* **18** (1950), 359-368.
7. *Ibid.* Leprosy in Uganda, Bugosa District. *Ibid.* **18** (1950), 507-517.
8. *Ibid.* Leprosy in Uganda, Kigezi District. *East African Med. J.*, **27** (1950), 1-5.
9. *Ibid.* Leprosy in Tanganyika, S. Province. *Ibid.* **27** (1950), 459-465.
10. *Ibid.* Leprosy in Northern Rhodesia. *Ibid.* **28** (1951), 21-28.
11. *Ibid.* Leprosy in Nyasaland. *Ibid.* **28** (1951), 168-173.
12. *Ibid.* Leprosy in Zanzibar and Pemba. *Leprosy Review*, **23** (1952), 459-465.
13. WHEATE, H. W., Leprosy in Teso Dist. of Uganda. *East African Med. J.*, **28** (1951), 420-422.
14. LOWE, J., Sex Incidence in Leprosy. *Internat. J. of Leprosy*, **2** (1934), 58.
15. COCHRANE, R. G., Practical Textbook of Leprosy. (1947), 19.

16. DE SOUZA CAMPOS, N., and DE SOUZA LIMA, L., *Lepra na Infancia*. Monograph of Serviço Nacional de Lepra Rio de Janeiro, 1950; Reviewed in *Internat. J. of Leprosy*, 20 (1952) 314-315.
17. LOWE, J., Preliminary report of an epidemiological survey in a typical rural area of Bengal. *Leprosy in India*, 10 (1938), 41.
18. COCHRANE, R. G., *Practical Textbook of Leprosy*. (1947), 12.
19. *Memoria del V Congreso Internacional de la Lepra* (official publication of the Government of Cuba). (1949) 481-487.
20. COCHRANE, R. G., *Practical Textbook of Leprosy*. (1947), 12.
21. RODRIGUEZ, J., Early Lesions in Children. *Philippine J. of Science*, 31 (1936), 115.
22. MUIR, E., Juvenile Leprosy. *Internat. J. of Leprosy*, 4 (1936), 45.

LEPROSY CONTROL IN BALOVALE DISTRICT NORTHERN RHODESIA

J. T. WORSFOLD, M.B., Ch.B.

There are few published references to leprosy in Northern Rhodesia. In 1932 Cochrane stated that "Northern Rhodesia had 1% of lepers in parts"¹ and all later findings indicate that this figure was fairly accurate. In 1939 Muir concluded that leprosy was much more common in Barotseland than elsewhere and singled out the Balovale District, then the Northern section of Barotseland, as the area which appeared to have the largest incidence.² Ross Innes, in his 1950 survey, did not include the western section of the Territory.³ As a result of Muir's suggestion an effort has been made to establish a modern treatment centre at Chitokoloki on the Zambesi, which is situated centrally in the Balovale District. Experience here in the past six years may be of general interest.

The Balovale District is a sparsely populated district on the upper Zambesi. In an area of approx. 10,000 sq. miles there is a population of 4,131 and a recent survey indicates that the incidence of leprosy does not exceed 9 per mille. A considerable proportion of the people and of the cases of leprosy are immigrants from neighbouring territories. The district is 50 miles from the line of rail and any European settled areas. The people are backward and the country undeveloped; there are now a considerable number

of elementary schools but few adults can read or write. In the Lovale section of the country, on the west bank of the Zambesi, there are no roads nor European residents. These facts, and the sparsely settled nature of the country, influence the measures that can be taken to control leprosy. The villages of the people are scattered along the Zambesi and its smaller tributaries, and between the groups of villages are often many miles of sandy, light bush country. In any group of villages, at the most two or three patients with leprosy are to be found. This makes local segregation villages on the Nigerian model, enforced by enlightened public opinion, impracticable. There is no fear of leprosy and its victims are not obstructed but the majority of those affected now desire treatment for health's sake. House segregation, even if desired, is not likely to be effective under prevailing social conditions. Polygamy is widely practised and a wife with leprosy is not regarded differently from others. It is usual for these people to completely remove their villages periodically, as their fields become exhausted; they are not averse to leaving a district entirely and starting afresh elsewhere.

There are indications that amongst this group resistance is relatively high and the epidemic on the decline:

1. *Few Children Show Clinical Signs of Leprosy.* Out of 1,509 school children examined in 1952 three were found with early indeterminate macules. From the whole area there are only two lepromatous children in the central settlement.
2. *Low Proportion of Lepromas.* For three years in succession (1949-50-51) the lepromas amongst new cases admitted were 14%.
3. *Low Incidence of Lepra Fever.* Usually only two or three cases are seen in any year.
4. *Long Latent Period.* A large number of those with infected near relatives do not develop the disease until middle or later life. There is good reason to assume that most of these have been in close or household contact with leprosy since childhood.

In a community such as this complete control should be possible in a reasonable time provided all cases can be brought under supervision. For the vast majority of adult Africans there is no employment available in the area and most are only too anxious to live in proximity to Europeans where they can find even a little remunerative employment and some measure of social security. This fact can be utilised to control the disease in the community. The answer probably lies in the provision of a

sufficiently attractive yet disciplined centre where all cases and contacts can be investigated and provided for administratively. It is not sufficient to segregate all lepromas—this district is producing a considerable group of clinically indeterminate cases the pathology of which suggests some will become lepromatous if not supervised and adequately treated. These cases are a danger as, before becoming frankly lepromatous, they are capable of infecting others.

A central settlement with permanent housing for 350 patients has been established at Chitokoloki. New cases reporting here are investigated and classified with special reference to origin, history, family contacts and children. Each new case has biopsy, clinical photograph, lepromin test, smears and routine check on concurrent disease done. After the above the case is assessed with a view to prognosis and disposal. A small number are out-patients (20%).

Those retained in the leprosarium include:

1. Advanced, grossly positive lepromatous. (10%).

These receive full rations, housing and comforts. Children are removed from them and if, for any reason, this is not possible, the children take prophylactic sulphone. If these advanced cases can be made contented under this regime their contacts are under close supervision.

2. Senile and grossly deformed patients requiring asylum. (6%).

These are provided for on compassionate grounds and a separate section of the leprosarium is reserved for them where each has his or her own hut, bed and rations for life.

3. The largest section are the able-bodied, otherwise healthy, patients with good prognosis and requiring *short-term* treatment. These are, in the main, early tuberculoid and indeterminate cases and most can hope to be discharged within one to two years and thereafter submit to 3-monthly examination. The routine outside work of the settlement is done by this group and many of them learn a trade while here; the entire settlement has been built by patient-labour. Generally, their contacts require no supervision. This group includes about 20% of all patients.

NYAMONA RE-SETTLEMENT AREA :

For all other patients (approx. 44% of the whole), relatively able-bodied and some requiring *long-term* treatment and supervision, a scheme of re-settlement villages has been established. The

local Chief has set aside, exclusively for leprosy patients, an unlimited area of unoccupied ground 3 miles from the base hospital and here some eight large villages have been established. Any patient, or ex-patient, who so chooses may settle here for the rest of his life. Many of these people have only residual lesions and minor degrees of trophic loss; a few are lepromas who are stabilised on sulphone and responding well to treatment. Some are early cases who go because relatives are already settled there. Many, if not most, are people who could well return to their home villages but for political and other reasons prefer the social security of living under the eye of a European.

These villages have become very popular. They have a good water supply from wells, the soil is relatively good and they have already brought under cultivation a huge area of virgin land. For food and housing the villagers are completely self-supporting. They get the same medical attention and treatment as the patients in the central leprosarium and there is no tendency for them to leave the villages as they own the houses and gardens. Any case of acute illness is admitted to the base hospital.

This experiment which is proving so practicable is providing a unique opportunity for observing the long-term results of sulphone treatment. At present the emphasis is on accurate record keeping as we are gathering in this re-settlement area, with no charge on public funds, a large number of former leprosy patients who have elected to remain under our observation and care for the remainder of their lives.

REFERENCES.

1. R. G. COCHRANE, "Leprosy in the Rhodesias," *Lep. Rev.* 3 (1932), 25.
2. E. MUIR, "Leprosy in Northern Rhodesia," *Lep. Rev.* Vol. XI, No. 1, 1940.
3. J. ROSS INNES, "Leprosy Survey, Northern Rhodesia," 3rd June 1950.

LEPROSY REVIEW. VOLUME XXIV.

INDEX TO VOLUME XXIV (1953)

	PAGE
<i>A</i>	
Anglo-Egyptian Sudan, East and Central Africa, Leprosy in—Introduction.	
R. G. Cochrane	177
Anglo-Egyptian Sudan, Leprosy in. R. G. Cochrane	178
<i>B</i>	
<i>Barnett, M.</i> (See Bushby, S. R. M. and Barnett, M)	19
B.C.G. and Immunity. F. R. G. Heaf	126
<i>Brand, P. W.</i> The Reconstruction of the Hand. Hunterian Lecture.	
(Reprint)	104
<i>Brown, J. A. K.</i> Leprosy Policy in Uganda	98
<i>Bushby, S. R. M. and Barnett, M.</i> The Activity of Isonicotinic Acid Hydrazide in Murine Leprosy	19
<i>C</i>	
<i>Chaussinand, R.</i> Tuberculosis and Leprosy: Mutually Antagonistic Diseases. (Translation)	90
<i>Cochrane, R. G.</i> Leprosy in Anglo-Egyptian Sudan, East and Central Africa	177
<i>Cochrane, R. G.</i> Report on Visit to Nigeria	33
<i>Cochrane, R. G.</i> Leprosy in Anglo-Egyptian Sudan	178
<i>Cochrane, R. G.</i> Leprosy in Kenya	181
<i>Cochrane, R. G.</i> Leprosy in Uganda	184
<i>Cochrane, R. G.</i> Leprosy in Zanzibar	191
<i>Cochrane, R. G.</i> Leprosy in Tanganyika	194
<i>Cochrane, R. G.</i> Leprosy in Nyasaland	208
<i>Cochrane, R. G.</i> Leprosy in Northern Rhodesia	214
<i>Cochrane, R. G.</i> Leprosy in Southern Rhodesia	222
<i>Corcos, M. G.</i> Human Lepa Bacilli exposed to Sunlight will retain their Acid Fastness if first heated	165
Correspondence	54
do. Penicillin and Perforated Ulcer. B. Moiser	169
<i>D</i>	
<i>Davidson, W. S.</i> An Evaluation of new Treatments and other Factors in Leprosy	139
<i>E</i>	
Editorial	3
Editorial	59
Editorial	123
Editorial. J. Ross Innes	175
Evaluation of new Treatments and other Factors in Leprosy. W. S. Davidson	139
<i>G</i>	
<i>Guadagnini, Mario.</i> Lepromatous Neuritic Lesions, their great incidence in certain Sensory and Motor Branches, and their Treatment	147
<i>H</i>	
<i>Heaf, F. R. G.</i> The Tuberculin Reaction	95
<i>Heaf, F. R. G.</i> B.C.G. and Immunity	126
Human Lepa Bacilli exposed to Sunlight will retain their Acid Fastness if first heated. M. G. Corcos	165
<i>I</i>	
<i>Innes, J. Ross.</i> The Leprotic Child in Africa	224
Iso-nicotinic Acid Hydrazide in Murine Leprosy, The Activity of. S. R. M. Bushby and M. Barnett	19

	PAGE
<i>K</i>	
Kenya, Leprosy in. R. G. Cochrane	181
Kuluva, The Story of. E. H. and P. H. Williams	132
<i>L</i>	
Lepromatous Neuritic Lesions, their great incidence in certain Sensory and Motor Branches, and their Treatment. Mario Guadagnini	147
The Leprotic Child in Africa. J. Ross Innes	224
Lowe, J. and McNulty, F. Tuberculosis and Leprosy. Immunological Studies	61
<i>M</i>	
MacArthur, Sir William. Mediæval Leprosy in the British Isles	8
Melsom, Reidar. Three New Cases of Leprosy in Norway	27
McNulty, F. and Lowe, J. (See Lowe, J. and McNulty, F.)	61
<i>N</i>	
Nigeria Leprosy Service. Vacancy for a Doctor	56
Nigeria, Report on Visit to. R. G. Cochrane	33
Norway, Three New Cases of Leprosy in Reidar Melsom	27
Nyasaland, Leprosy in. R. G. Cochrane	208
<i>R</i>	
Ramanujam, K. Treatment of Leprosy with "Sulfon-Cilag"	156
Reconstruction of the Hand in Leprosy. Hunterian Lecture. (Reprint) P. W. Brand	104
REVIEWS :	
Isoniazid in Leprosy. (Lowe, J.) <i>Lancet</i> 263, p. 1012-1013	51
The Influence of recent advances in leprosy on present day conceptions of the disease in relation to its diagnosis, treatment and prevention. (Cochrane, R. G.) <i>Edin. Med. Jl.</i> 59 (1952) 509	51
ACTH and Cortisone in treatment of complications of Leprosy. (Lowe, J.) <i>Br. Med. Jl.</i> No. 4787 (1952) p. 746-9	52
The Chemotherapy of Leprosy. (Cochrane, R. G.) <i>Br. Med. Jl.</i> No. 4796 (1952) p. 1220-3	52
<i>Leprosy in India</i> , Vol. 24, 1. (Jan. 1952)	53
<i>Leprosy in India</i> , Vol. 24, 2. (Apr. 1952)	54
<i>Leprosy in India</i> , Vol. 24, 3. (July 1952)	170
<i>International Jl. of Leprosy</i> , Vol. 20 (1952), July-Sept.	119
The Mask of a Lion. (Simeons, A. T. W.) Victor Golancz, 12/6d.	171
Leprosy—with particular reference to conditions at present pertaining in the British Isles. (Cochrane, R. G.) <i>Public Health</i> , Sept. 1952	172
Four Cases illustrating aspects of Leprosy. (Cochrane, R. G.) <i>Proc. Roy. Soc. Med.</i> 45 (1952), No. 5, p. 249-253	172
Leprosy in Northern Rhodesia. R. G. Cochrane	214
Leprosy in Southern Rhodesia. R. G. Cochrane	222
Leprosy Control in Balovale District, N. Rhodesia. J. T. Worsfold	231
<i>S</i>	
Sixth International Congress of Leprosy	117
'Sulfon-Cilag,' Treatment of Leprosy with. K. Ramanujam	156
<i>T</i>	
Tanganyika, Leprosy in. R. G. Cochrane	194
The Tuberculin Reaction. F. R. G. Heaf	95
Tuberculosis and Leprosy. Immunological Studies. J. Lowe & F. McNulty	61
Tuberculosis and Leprosy: Mutually Antagonistic Diseases. (Translation.) R. Chaussinand	90
<i>U</i>	
Uganda, Leprosy in. R. G. Cochrane	184
Uganda, Leprosy Policy in. J. A. K. Brown	98
<i>W</i>	
Williams, E. H. and P. H. The Story of Kuluva	132
<i>Z</i>	
Zanzibar, Leprosy in. R. G. Cochrane	191