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TREATMENT OF PERFORATING ULCER OF THE FOOT

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Much has been written on this subject, and the writer's apology for adding to the literature is that he has recently had considerable experience of this condition which is among the three most common and important complications of leprosy.

Definition.

Perforating ulcer differs from the other form of ulcer found in leprosy, commonly called "lepromatous": (a) in *not* being due to the local presence of M. lepræ, (b) in being a sequela of impaired trophic and sensory supply to the foot, or the part of the foot involved, (c) in being confined to the sole of the foot, while lepromatous ulcers are found on other parts of the body surface.

Causation.

The destruction or blocking of the sensory nerves, primarily by cellular pressure on, and later by fibrous constriction of, the axis cylinders deprives the foot of sensation and trophic supply and to a certain extent involves the vascular supply. The motor nerve supply is also affected when the disease spreads to the larger mixed nerves.

It is difficult to dissociate these four elements. We are all familiar with the temporary feeling of paralysis of the lower lip when an anæsthetic has been injected for extraction of a tooth from the lower jaw. By comparison it is easy to understand the paresis of the small muscles of the face, hand and foot when leprosy causes anæsthesia of the covering skin, an anæsthesia which lasts not for a few hours as in the dental extraction, but for months and years. Thus the small muscles of the foot, deprived of their normal sensory stimulus, become paretic, and fibrous tissue takes the place of muscle fibre.

These muscles normally support the arches of the foot and act as padding between the bones and the ground. They give elasticity to the foot and their tension keeps the bones of the foot strong and hard. All these functions are impaired by anæsthesia of the foot, and the muscles are further affected by interference with the motor supply; and all the parts, skin, joints and muscles, are further weakened by interference with the trophic and vascular supply.

In this weakened condition of the foot a small injury is sufficient to initiate what is known as a trophic or perforating ulcer. Such injuries are the more liable to occur as the protective influence of sensation is withdrawn, and the patient may be unaware of an abrasion caused by rubbing of the shoe or the perforation of a sharp stone, thorn or nail.

The ulcer may at first be superficial, but if not attended to at once it tends to affect the deeper structures and penetrate to the bone. Septic infection complicates the process; the soft and decalcified bone becomes carious, and an abscess of the foot may occur which, after a few days, may be discharged through the perforation.

Treatment.

Perforating ulcers may be divided into two groups: superficial and deep, the bone being affected in the latter.

Superficial ulcers generally show the qualities common to all chronic ulcers: a septic floor surrounded with raised, schlerosed non-vascular edges. Demobilisation with the application of the

usual poultices and antiseptic dressings may cause healing, and this process may be accelerated by infiltration into the surrounding subcutaneous tissue of a mildly irritant fluid, such as hydnocarpus oil (1 or 2 c.c) or a 1 in 4 solution of Dettol (1 to 2 c.c), which causes exfoliation of the thick surrounding cuticle.

When the bone is involved its removal is essential, and it will be found wise to reverse the usual surgical rule and *not* be too conservative in the amount removed.

While perforating ulcers may occur anywhere in the sole of the foot, by far the commonest sites are the heads of the metatarsals, the first metatarsal being that most commonly involved.

While a more conservative operation may suffice in the slighter cases, the operation of choice is complete metatarsectomy. This causes narrowing of the foot, but the result is much more likely to be permanent. There is nothing more damaging to the health and confidence of the patient than an ulcer which recurs whenever he begins to walk again.

Metatarsectomy.

The writer recommends the following technique which he has found simple, rapid and satisfactory in its results. An anæsthetic is seldom necessary as sensation is almost entirely absent. The patient lies on the table with his foot projecting and the end of the table supporting his *tendo archilles*. After the parts have been thoroughly cleaned and iodine has been applied, a tourniquet is applied firmly over a piece of lint round the middle of the thigh. Sterile towels are arranged so that only the distal part of the foot is uncovered. An incision is made in the sole beginning at the ulcer, extending for the whole length of the metatarsus and cutting down to the bone. The bone is quickly cleared, as is also the proximal phalanx if it is involved. A small cutting bone forceps is useful in disarticulating the bone and disengaging it from its bed. When the bone has been removed the sides of the ulcer are dissected out and the wound is trimmed, the edges being undercut and freed so that they come together, if possible, without tension. Sulphanilamide powder is rubbed thoroughly into the wound. Sterile gauze is inserted sufficient to stop bleeding but not to prevent the approximation of the edges; the end of the gauze projects through the dependent end of the wound. The wound is closed with a few strong, deep sutures, and over an outside dressing a tight bandage is applied. The tight packing of gauze, the sutures and the tight bandage do away with the necessity of applying ligatures, thus saving much time. The whole operation may be finished in 15

to 20 minutes, and this is important, as the patient generally begins after that time to complain of the pressure of the tourniquet. This is removed as soon as the first few turns of the bandage have been made. The sulphanilamide powder keeps the wound clean, so that the first change of dressing can be delayed for forty-eight hours, by which time the danger of bleeding is past. The gauze is removed and a thin wick of gauze powdered with sulphanilamide powder inserted.

The wound generally takes about three to four weeks to heal, but the patient should not apply his foot to the ground for a further four weeks, so as to give the fibrous tissue time to consolidate.

After the first forty-eight hours the patient should be encouraged to walk about on crutches, keeping his foot carefully off the ground.

The last two rules are indeed important in the treatment of all perforating ulcers even when an operations has not been necessary.

When a perforating ulcer occurs, as is less often the case, in connection with the heel, operative measures are less satisfactory. If rest, dressings, and infiltration of the subcutaneous tissue round the ulcer do not bring about a permanent cure, a layer of the bone in the base of the wound may be gouged out and the edges undermined, trimmed and brought together as described in the operation above.

After operation, or in simple cases where operation is not necessary, unless the healed wound has time to consolidate (generally 3 to 4 weeks), it is likely to recur; but the use of crutches removes the need for confinement to bed, which is so harmful to the general health and interferes with the beneficial effects of exercise in the treatment of leprosy.

In many cases the writer has found the progress of the patient handicapped, or altogether stopped, by the demobilisation attendant on perforating ulcers as well as by septic absorption from the wound. On this account he considers it imperative that immediate steps should be taken to effect permanent healing. Much can be done to prevent the occurrence of perforating ulcer by the use of proper footwear, the application of suitable padding inside the shoes, and careful hygiene of the feet. When anæsthesia of the feet occurs the patient should be warned beforehand of the dangers and taught how to avoid them.

LEPROSY CONTROL IN THE OWERRI PROVINCE

FOURTH ANNUAL REPORT ON CONTROL WORK UNDERTAKEN BY THE STAFF OF THE NATIVE ADMINISTRATION LEPROSY SETTLEMENT, UZUAKOLI

T. F. DAVEY, M.Sc., M.B., CH.B.

INTRODUCTION

The year 1942 has witnessed further wide expansion of the work of the Uzuakoli Settlement. Clinics operating at the commencement of the year have become firmly established, and with 15 clinics opened during the year, regular leprosy treatment is now being given at 44 centres, and over 11,000 patients are being treated every week. The shortage of hydnocarpus oil has often rendered the maintenance of treatment very difficult, but in spite of the enforced low dosage, 172 patients have been discharged symptom free from clinics and 60 from the Central Settlement.

Leprosy control has made considerable progress. Lepers have now voluntarily segregated themselves in 14 model villages. In addition, 20 more sites for villages have been approved and building is in progress on some of these.

In spite of the large scale of the work now being undertaken, one half of the Province remains untouched. In Bende Division intensive leprosy control work is in progress and possibly 50 per cent. of the leper population is receiving treatment. In Okigwi and Orlu, in spite of huge numbers of patients, we are but touching the surface of the problem. In Owerri and Degema Divisions there are no clinics whatever, while in Aba and Ahoada, control work is in its infancy. It is now obvious that we must consider 50,000 as too low an estimate for the number of lepers in the Province.

The rapid growth of our work has thrown a great strain on the central staff, both European and African. By adjustments in the method of clinic visits more has been crowded into very busy lives, but in the interests of health it was necessary to call a final halt during the year. For the last six months almost all requests for clinics have been refused, and propaganda has been deliberately stopped. The people of the Province are now leprosy conscious and there is a widespread desire for leprosy control work in all Divisions combined with a readiness to co-operate by providing land and buildings

free of charge. Until it is possible to increase our staff, both African and European, we must continue to refuse all requests for new work.

The main lines of the leprosy control policy we are pursuing are now firmly established. A discussion of these was included in last year's report and was published in the Leprosy Review (Vol. XIII., No. 3, July 1942). New developments and considerations will be discussed below under their appropriate heads.

STATISTICS.

The following table summarises the figures for leprosy treatment centres, numbers of registered patients, total attendances and symptom free discharges.

Totals.

Centres for Treatment	44
Registered Patients	11,548
Total Attendances	405,060
Symptom Free Discharges, 1942	172
Total from Clinics to date	249

These figures do not include statistics for dressings or attendances at clinics for other purposes than specific leprosy treatment. At many clinics dressings are given daily, and during the year hundreds of thousands of dressings are given.

Figures for model village settlements are given later.

THE CENTRAL SETTLEMENT.

During 1942 the Uzuakoli Settlement has amply fulfilled its function as the centre for organisation, administration, training, hospital treatment, laboratory work and children's work. 1,255 patients have been resident during the year, including 163 seriously ill patients who have been admitted from clinics for hospital treatment. The hospital has had its busiest year since the foundation of the Colony and has been consistently overcrowded. The Central Ulcer Clinic has been equally busy, and has been in the hands of Mrs. Grainger. Over 35,000 dressings have been given here alone. The training of patient nurses has continued throughout the year, there being 100 of these. Reference is made elsewhere to the large increase in Leprosy Inspectors. These have all been trained at Uzuakoli. The Laboratory and Diagnostic Centre has been fully maintained, outstanding features being the introduction of the Lepromin test, using our own material, and the manufacture of our own Kahn antigen. With the multiplication of clinics, the

work of the Central Dispensary has greatly increased, and an elaborate distributing system is necessary to ensure that clinics are provided with their requirements. All the hydnocarpus oil used is processed at Uzuakoli, though supplies have been inadaquate for the greater part of the year.

510 of the permanent residents of the Settlement are supported by the Native Administration, and the award of these free places formerly bore no relationship to clinics. During the year an important change has occurred, and in Divisions where clinics are operating we are now ourselves authorised to select suitable cases to fill free places at Uzuakoli. In this way it is possible to bring into the Settlement those types of case who cannot be adequately treated at clinics, namely, lepromatous cases, the aged and infirm, cripples, paupers and children. There are now large numbers of these at Uzuakoli. A special Home for Crippled and Aged patients is now being planned. There are 200 children in the Settlement and a central feeding system started in December 1941 has proved an outstanding success. Nearly 200 people are being fed and there has been a marked improvement in physique and general condition as a result of this. A new refectory has been built during the year.

Work among uninfected children has suffered greatly as a result of the war, as supplies of milk have been irregular. Since 1940 no more infants have been admitted into the Babies' House and there remain 7 young children there. No deaths have occurred during the year, and five of the children are taken daily to the kindergarten department of the Uzuakoli College Demonstration School, where they receive free tuition. A mothers' compound has been in operation during the year where uninfectious mothers are themselves segregated with their uninfected infants. There are 13 of these. Every clinic gives evidence of the urgent necessity for large scale preventive work among uninfected children. This can only be carried out at some such centre as Uzuakoli, and during 1942 proposals have been made for an experimental scheme to meet this problem. It is hoped that a start will be made during 1943.

The life of the patients in the Central Settlement is highly organised. Planned work and physical training contribute to make treatment effective, while many social activities occupy and improve the mind. Industries and handicrafts are numerous, and special mention should be made of the school and the Boy Scout troop.

Agriculture is directed to the growing of crops for the communal feeding centre, and a small herd of cattle is being kept

as an experiment for the purpose of obtaining milk for uninfected children.

During November we were greatly honoured by a visit from His Excellency the Governor of Nigeria, who was accompanied by Lady Bourdillon. The keen interest they showed in all branches of the work was an inspiration both to out-patients, in-patients and staff.

CLINICS.

With the addition of 14 opened during 1942 clinics now total 43. They show wide diversity, reflecting the neighbourhood where they are situated. Many have resident nurses, and 27 are supervised by Leprosy Inspectors. Two clinic units from Uzuakoli are always on tour visiting these clinics, one of which is visited weekly, 18 fortnightly, while with few exceptions the rest are visited monthly.

The vast majority of clinics are in Bende and Okigwi Divisions, and intensive anti-leprosy work is being done in this area. In Bende there are 16 clinics, while there are 20 in Okigwi (with Orlu). Although two of these clinics are very large, it will be observed from the statistics that we have provided many medium sized clinics rather than a few large ones. There are definite reasons for this. The population is everywhere dense, and the leprosy incidence very high. *The object of our work is not leprosy treatment, but leprosy control,* and all our activities must have this end in view. In the achievement of leprosy control the willing co-operation of all patients and healthy people is essential. The clinic is the first stage in the process of control, and it is most important that its method of management wins that co-operation which is later needed for more vital measures, such as surveys and segregation. As far as patients are concerned, the normal services of the clinic, such as free leprosy treatment, free ulcer treatment, legal advice, combined with sympathy and encouragement soon produce a co-operative attitude in those who attend, and some are willing to travel considerable distances in order to receive the benefits of the clinic. These are very much in a minority, however, for ulcers are numerous and bodily infirmity prevent many from travelling far to a clinic. Such people cannot be expected to walk more than five miles to a clinic, and if clinics are few it follows that many feeble cases (including a high proportion of lepromatous cases) simply cannot attend on account of the distances involved.

A more important consideration now arises. In our ex-

perience, in spite of propaganda, never more than 50 per cent. of patients in a locality come to the clinic of their own accord, and often the percentage is far less. Every survey undertaken reveals this fact. The untreated cases simply remain at home either in a state of hopeless despair or else attempting to hide their lesions under clothing or stains. For purposes of leprosy control it is essential that these come within the influence of the clinic, and it is therefore necessary that we should make it as easy as possible for all patients to take treatment.

As far as healthy people are concerned, the population of the Province, everywhere dense, is divided into many clans. In its early stages, leprosy control work evoked universal opposition, but as a result of propaganda many clans are now willing to give land and buildings for the sake of their own lepers, and interest is shown in the welfare of the clinic which is regarded as belonging to them and existing for the good of the clan. This co-operative attitude would be destroyed immediately if the clinic was made available to lepers from other clans, and when opening a clinic we usually have to promise that we will admit local patients only. This attitude is sound and must be respected. Large scale movements of lepers within a densely populated area are to be deprecated, but are inevitable if clinics are few and open to all-comers.

An illustration of this is provided by our own experience when clinics are few. At that time, as the news of the clinic spread, patients came from far and near. On discovery that the clinic was for local people only, some people from a distance came and lodged in nearby villages and later appeared at the clinic, posing as local inhabitants. The clinic was thus immediately responsible for an influx of lepers into the neighbourhood, and one has an uncomfortable feeling that rather than fighting leprosy, the clinic was in fact actually increasing the amount of leprosy in the neighbourhood. Even had there been no restrictions, the effect would have been the same, for leprosy treatment is tedious, and rather than walk 20 miles or more every week to a clinic, patients would prefer when the novelty has worn off to lodge in some village near at hand. Local lepers would be only too glad to receive paying guests.

In the earlier days of our work we therefore had to choose between a few large clinics with thorough weekly supervisions by Europeans, and many smaller clinics in which a certain amount of responsibility is on African shoulders. All these weighty arguments induced us to take the latter course, and the soundness of this policy in Owerri Province is proved by

the fact that starting in this way it has been possible to produce a high degree of leprosy control in several localities, where all infectious cases of leprosy are segregated following surveys of the entire population. This could never have been achieved without the full and willing co-operation of patients and healthy people alike. The way is now open for similar measures over a wide area of Bende and Okigwi Divisions, and requests for clinics and offers of land are being received from a yet wider area. Most clans in Bende and Okigwi now have their leprosy clinics and there is no longer any need for patients to travel far from their homes for treatment. As preventive work develops there is every prospect that well over 90 per cent. of cases will come to clinics of their own accord. Patients are now being discharged symptom free from many clinics, and this is encouraging backward cases to come forward for treatment.

The original policy of paying no rent for clinic sites and providing no buildings is still being pursued, these representing the contribution of the local people to the work. No new clinic is opened until the site has been given and approved, the land cleared and buildings erected, without any expense being incurred by us. Local interest has thus to be proved before work commences.

Leprosy treatment follows a fixed routine at all clinics and the nurse has to learn this over a period of 18 months devoted to training at Uzuakoli before he may go to a clinic. At clinics with resident nurses ulcer treatment is given daily. All registration, examination and bacteriology is carried out by the Touring Unit from Uzuakoli, which also carries with it a stock of medicines for various complaints which may be supplied to patients and so obviate their attendance at N.A. Dispensaries where their presence is neither welcome nor desirable.

Markets operate at several clinics, and this is fully encouraged.

LEPROSY INSPECTORS.

There has been a notable increase in the number of Leprosy Inspectors, especially in Bende Division and in Orlu District. The importance of the work of these non-leper local preventive workers cannot be exaggerated and with a small Central Leprosy Staff it is correct to say that the progress of leprosy control in the Province is dependent on the existence and work of these men. Apart from being partly responsible for the maintenance

of one or more clinics, they do propaganda, carry out leprosy surveys, supervise segregation in model villages, and once control has been achieved they can maintain it by regular service. At the present time there are 15 of these men distributed as follows:—

Bende Division	7	(increase 4)
Orlu District	4	(increase 4)
Aba Division	3	
Ahoada Division	1	

A course of training was held at Uzuakoli during 1942 and the Senior Health Officer, Enugu, kindly co-operated in this.

The work of these men is closely allied to that of Native Administration Sanitary Inspectors. In the Orlu District an experiment is being carried out whereby two N.A. Sanitary Inspectors on returning from their course of training at Ibadan received extra training at Uzuakoli and are now combining the work of a Leprosy Inspector with that of a Sanitary Inspector, devoting three days weekly to each. This is an excellent arrangement provided the men concerned are suitable, and is capable of wide application. In the model village the Leprosy Inspector is able to present an object lesson in sanitary methods which is more valuable than much good advice, while leprosy surveys not only familiarise him with the area but reveal all those sanitary defects which are the concern of the Sanitary Inspector.

The ideal arrangement would be for all Sanitary Inspectors to concentrate on leprosy work after their training and gradually increase the amount of sanitary work done as leprosy control becomes perfected. Leprosy Inspectors will also provide excellent candidates as N.A. Sanitary Inspectors.

VOLUNTARY SEGREGATION.

The number of villages where voluntary segregation is either complete or is proceeding are as follows:—

In the Bende Division	7
In the Okigwi Division	3
In the Ahoada Division	3
In the Aba Division	1

This represents an increase of 4. Had staff permitted, the number would have been much greater, for there has been a striking increase in the number of sites offered for segregation purposes. Twenty sites have been approved in addition to the above. These are situated as follows:—

Bende Division	10
Ogikwi Division	7
Aba Division	2
Ahoada Division	1

In the Bende Division there is an area where leprosy control is complete. All infectious cases of leprosy have voluntarily segregated themselves at Etiti Ama and Ama Orie Nkporo, and in all the villages of the Ndi Oji Group of Abam clan. A high degree of leprosy control also exists at Ozuitem and Bende, where segregation is proceeding and is approaching completion. A similar state of affairs holds throughout the Abua Clan, Ahoada Division. Partial segregation exists in several areas.

LEPROSY SURVEY.

The time and energies of the Central Leprosy Staff are being fully occupied in maintaining leprosy clinics, and it has been impossible to undertake any large surveys during the year. On the other hand, much survey work has been carried out by Leprosy Inspectors, and though this lacks the scientific thoroughness of surveys carried out by the central staff, it represents in my opinion the only solution to the problem of mass survey work. The population of the Province is believed to exceed two million. The scientific survey of this mass of population would take many years. In order to maintain leprosy control, repeated surveys are necessary, and it is therefore impracticable for a team consisting of a few medical men with their assistants to meet the need.

Very useful surveys can be undertaken by Leprosy Inspectors, and as each works in a limited area, he becomes well known to the local people, and this of great value. Further, repeated surveys can be, and indeed are being carried out, and in this way leprosy control becomes a policy for the present rather than a dream for the future.

Surveys by a specialist team are of special value from the standpoint of research, though it should be pointed out that surveys of this type have been carried out at all those areas where leprosy control has been established already, namely, Etiti Ama and Ama Orie Nkporo, Ndi Oji Abam, Bende, Ozuitem. There is a tremendous demand for survey work in all parts of the Province, but apart from Leprosy Inspectors nothing more can be done until the Central Staff is increased.

Leprosy Inspectors have carried out surveys in Aba, Bende and Ahoada Divisions with the following results:—

AHOADA DIVISION.

In the Abua Clan, where leprosy control has been achieved, the entire Abua Group, embracing a population of 7,000, was examined for the third time, and 40 new cases were discovered. Without exception these were early cases and the result was to be expected. All the cases found were examined by me on the occasion of my visit. Leprosy control has only been established for about 18 months in this area, and more new cases must be expected for the next two or three years. After this time the number of new cases should fall rapidly.

Aba Division.

	Villages	*Population examined*	*Lepers found*	*Incidence per cent.*
Asa Clan	19	8481	189	2.2
Ndoki Clan	19	2399	129	5.2
Bende Division.				
Oboro Clan	9	2285	27	1.2

Cases on observation 35.

Surveys are now in progress in Ozuitem Clan, Ibeku Clan, Oboro Clan, Nkporo villages, and have commenced in Chafia Clan.

SUMMARY OF PROGRESS IN THE VARIOUS DIVISIONS.

	Bende Division	*Okigwi Division*	*Okigwi Division (Orlu District)*	*Aba Division*	*Ahoada Division*	*Owerri Division*
Registered patients at Clinics	4007	2920	1456	515	903	
Patients at Uzuakoli ...	413	431		31	75	181
Number of Clinics	16	12	8	4	3	
Number of Leprosy Inspectors	7	Nil	4	2	1	
Number of villages inhabited by patients segregated voluntarily	7	3			3	
Village sites approved in addition	10	3	3	3		

Intensive leprosy work is going on almost throughout the Bende Division. The appointment of four new Leprosy Inspectors during 1942 has been of tremendous value, and leprosy control is now making great strides. The population of the Division

is in the neighbourhood of 180,000, divided into 17 Clans. Leprosy surveys have been carried out in eight of these and, at the present rate, the entire population will have been surveyed within four years. Leprosy control is complete, or almost complete, in four areas and is advancing in several more and, provided staff can be maintained, the outlook is most promising.

The outstanding need in Okigwi Division is the appointment of Leprosy Inspectors. It is impossible to proceed much further along the road to leprosy control than the maintenance of clinics until Inspectors are appointed. No surveys have as yet been carried out, and the three model villages at Uturu, Leru and Ogeh have arisen solely through the eagerness and initiative of patients themselves, led by nurses from Uzuakoli. Nurses are doing a fine piece of work in this area. The Clinic and Settlement at Uturu needs special mention, for it is unique. Here more than 600 patients have voluntarily segregated themselves, and there exists a miniature Uzuakoli, with its police, handicrafts, boy-scouts, play and wrestling clubs and various other organisations. There are two churches, Methodist and Roman Catholic, the former with a resident teacher, himself a patient, who is supported by the local people. The cost of maintaining this Settlement is negligible. There are practically 1,000 registered patients at the clinic attached to the Settlement.

If Leprosy Inspectors can be appointed in the Division there is no reason why progress should be delayed.

The opening up of work in Orlu has been the most notable advance during the year. During the last six months eight clinics have opened, and patients are pouring into these every month. There is without doubt a very high incidence of leprosy and the state of lepers is pitiable in the extreme. Survey work is just starting, and work is commencing on two segregation centres. In some parts of Orlu the density of the population renders villages of the type prevailing in Bende an impossibility. Nevertheless the people town by town are willing to give small sites where patients may be segregated in model compounds, and this is perfectly satisfactory.

Leprosy work in the Aba Division is on a small scale, and has existed for 17 months. After many early struggles and disappointments it has now become well established, and a new spirit of co-operation prevails. During the last three months two new clinics have been requested, and two new sites for model villages have been offered. The outlook in Asa and Ndoki

clans is promising. Surveys have proved that the incidence of leprosy is high.

Leprosy work in Ahoada is confined to Abua Clan, where it has been in existence for two years and nine months. Here a very high degree of leprosy control prevails, and the Abua model village is among the best. One unusual feature of the work in this area is the remarkably good response to treatment. Already in this clan alone 137 patients have been discharged symptom free from the clinics and there is a notable improvement in the condition of many lepromatous cases, which is an unusual finding.

There is now a widespread demand for leprosy work in the Ahoada Division. Clinic sites have been offered in various areas, and at one of these, namely Omoku, it is hoped to open a clinic in the near future. The Division is ripe for the development of leprosy work but shortage of staff is prohibiting further work at present.

There are as yet no clinics in Owerri Division. In the past this has been due to lack of interest on the part of the people, but during 1942 enquiries have been received from several parts of the Division. The Division is large and densely populated and the opening of one clinic now will probably create a demand for many more, so for the time being we are regretfully forced to refuse to start work. When staff makes it possible we shall gladly do so.

Insistent requests for clinics are constantly being received from Degema Division. Transport problems make the opening of leprosy work out of the question at the present time.

PROPAGANDA.

All direct propaganda has been deliberately stopped, as the demand for leprosy work in the Province far exceeds our capacity to meet it. Nothing more can be done until staff is increased. Unfortunately for our peace, the ever growing numbers of people discharged from clinics form centres of propaganda over which we have no control.

ACKNOWLEDGMENTS.

A special tribute should be paid to the Central Staff, both African and European, who have given devoted service through a difficult year with good humour and without complaint in spite of being constantly overworked.

Dr. and Mrs. Ross, of B.E.L.R.A., have been on leave for the greater part of the year and their return is eagerly awaited both by patients and staff.

Mrs. Grainger, of the Methodist Missionary Society, is an

honorary and valued worker who returned from leave during the year and resumed responsibility for ulcer treatment, the communal feeding centre, social work among women and the planning and planting of village and Settlement gardens. She has carried out her duties, often unpleasant, with distinction. Mention should be made of the fact that during 1943 Mrs. Grainger is retiring after many years of service in Nigeria.

Mr. and Mrs. Tuck, of B.E.L.R.A., returned from leave during the year. Mr. Tuck is the Settlement accountant and also plans model villages. Mrs. Tuck has assumed sole charge of the Settlement school, which was left without a certificated teacher when the headmaster was discharged last year. Mrs. Tuck has full qualifications for this task and her work is much appreciated.

Mr. Walter, of B.E.L.R.A., has worked throughout the year in the dispensary and is the scoutmaster.

Mr. Dalton, of B.E.L.R.A., is now on leave and acted as relief for Mr. Tuck.

The maintenance of the work of the Settlement has only been possible through the great assistance given by voluntary organisations.

The Methodist Missionary Society has co-operated in the Settlement since its foundation by providing the person of the Medical Superintendent and by an annual grant devoted to religious and social work. This supports a resident catechist, helps to finance the school and enables assistance to be given to necessitous patients.

The Mission to Lepers gives an annual grant for work among uninfected children.

B.E.L.R.A. and Toc H are giving wonderful assistance by providing and supporting European personnel.

Lastly, I wish to acknowledge the constant help and interest of His Honour the Chief Commissioner, Eastern Provinces, of the Resident, Owerri Province, and of all District Officers. Their co-operation in all our schemes has been of incalculable value and much of the success of the clinic work is due to their efforts.

LEPROSY AFTER THE WAR

B. MOISER, O.B.E., M.B., M.R.C.S.

We read and hear a great deal about provision for men who have been blinded and maimed in the present War, but no reference to leprosy has been observed.

No figures are available here in connection with the spread of leprosy after the 1914-18 War, but I think that it can be taken as certain that there will be a number of British soldiers who will have become infected with the disease during this war, especially amongst prisoners of war.

Many of the countries involved in the present war are

highly endemic areas. Greece and Crete are by no means free from the disease, whilst it is very prevalent in West Africa, and right across to Egypt and the Sudan. Figures of five per thousand are given for large tracts of Africa, e.g., Belgian Congo, the Rhodesias, French Equatorial Africa, Uganda, and almost the whole of the rest of Africa between 20 degrees North and South show one or more per thousand. India, China, Japan and the Netherlands East Indies exhibit a similar degree of endemicity.

The conditions which are favourable for the spread of the disease are war, hot moist climate, poor housing, overcrowding, ignorance of the disease, undernourishment, insanitary conditions and lack of facilities for personal cleanliness. With large numbers of soldiers waging war under such conditions, especially in the Far East, it seems impossible for numbers of them to escape infection from leprosy. I fear that the numbers may be large.

What is to be done for these men? It seems to me that now is the time to make preparations for them. Is Britain a suitable place for them? My answer is in the negative, both from the point of view of the patients themselves, and because of the undesirability of reintroducing the disease into the British Isles, i.e. from the Public Health point of view.

Fourteen years' experience at Ngomahuru Leprosarium in Southern Rhodesia, near Fort Victoria, a few miles from the renowned Great Zimbabwe Ruins, prompts me to suggest that Ngomahuru is a very suitable place for them. The type of the disease in Southern Rhodesia is a mild one. The climate is very suitable. Remarkably good results from treatment have already been recorded at Ngomahuru, in both white people and in natives.

Ngomahuru is an estate of 8,400 acres of undulating land, interspersed with rocky kopjes, well wooded, with a good water supply, and a marked absence of malaria. Mosquito nets are unnecessary at any time of the year. There is always a breeze. March and October are hot, but the temperature on my verandah has never reached 100°F. Most of the land still remains to be cultivated. Horses, cattle and sheep thrive well. In short, Ngomahuru is just waiting to be developed, and in my opinion offers the best possible chance of complete recovery from the disease, and a return to normal life later.

This idea of making Ngomahuru into a "British Empire Leprosarium" has been mooted for several years, and indeed it is in existence as such in a small way already, for a few

Europeans from England, India and Burma have been cured here, or are still undergoing treatment.

Patients would not be herded together in the wards of a large hospital. They would live in separate completely detached, self-contained homes, one man to each house, or perhaps two friends sharing one house. Each man would grow his own vegetables and flowers, with the help of native servants, and would make the place his "Home" for as long as he remains here. His surroundings should, and would, be made as attractive as possible, and he must have congenial occupation. For instance, one man here at present is in charge of the water supply, which is pumped up from the River Tokwe, and he receives remuneration for this. Another is giving his valued services free as a clerk in the office. Plenty of outdoor occupation can be found in supervising labour gangs of native patients on the Farm, roads, plantations, etc.

Recreation can easily be provided. A golf course has been in existence for some years, but was ploughed out for farm crops as a war measure. There are two tennis courts in existence. One man has his own small swimming bath which is filled with chlorinated water, so that it is free from bilharzia. There is a boat on the river, and there are fish to be caught there. Guinea fowl, francolin and small game provide sport. The native patients play football with enthusiasm. Cricket is a possibility for Europeans. A reading-room and indoor games present no difficulties. The large "Beit Hall" already in existence is used for religious services.

Under such conditions, nobody could regard himself as a "prisoner." He would have ample liberty to do as he liked, and motor around the countryside. I have always laid stress on the psychological aspect of treatment. Men must not be allowed to feel in any way that they have an "unclean" disease or are in any sense outcasts. One man here has told me that the days "fly by," that he has forgotten that he has any disease at all, that he feels "OF" the place and not "IN" it. That man is getting well rapidly. His wife, who lives in Fort Victoria, comes to visit him at week-ends. His small daughter is allowed to come occasionally, so long as certain restrictions are observed. Another man (from India), who was cured here, has bought a farm in the neighbourhood, married, and settled down most happily and successfully.

Then comes the question as to whether a man may have his wife to live with him. I have always encouraged this, for conjugal infections are rare. It is rather a matter for the man

himself to decide after all the facts have been explained to him. One such example has been here for over two years, with the happiest effects. They have made their house and garden most attractive; their rockery, which is a natural one, is always a beautiful sight. They have their friends to visit them, but the begetting of children is discouraged, for that would mean the departure of the wife and child, at least temporarily.

Such is the picture I have witnessed here for the past fourteen years, a very different picture from what most people imagine a Leprosarium to be.

So here is the place, and I hope it will become the recognised "British Empire Leprosarium," where our stricken soldiers can live in comfort and happiness until they return to normal life again.

It is my small part to bring this idea to the notice of the Imperial Government, and of the Colonial Office, and it will be theirs to work out the financial situation, with the Government of Southern Rhodesia. I might here add, in conclusion, that a house with water, indoor water-borne sanitation, and electric light will cost about £700 to £1,200 according to size.

A GREAT LEPROSY WORKER

The news of the death of Dr. F. G. Rose, Medical Superintendent of the Leper Hospital, Mahaica, British Guiana, will bring deep regret to a wide circle of friends not only in the Caribbean but throughout the world.

Dr. Rose might have held a high position in other lines of medicine, but some seventeen years ago he felt a call to a kind of work which few were willing to undertake. At that time the Mahaica Leper Hospital was in a pitiable condition, little was done to treat the patients or alleviate their miserable condition, the site was swampy and malarious. For the rest of his life Dr. Rose gave himself up wholeheartedly to the service of these unfortunate people.

Dr. Rose was a good physician but he was more than that. He was a Christian gentleman with high ideals and broad culture. Among his hobbies were music and drama and he gave the patients the full benefit of his talents. He trained an excellent band and organised entertainments. He introduced various industries and constructed the second best cricket ground in the Colony, encouraging the patients in all forms of sport and healthy recreation.

A few months ago the writer had the privilege of spending two weeks with Dr. Rose and studying his methods and noticed how he treated the patients as his children and they addressed him affectionately as "Daddy." Day and night he was at their call and he was never too tired or pre-occupied to give them the utmost of his skill and service. He took particular interest in the young and founded a home for leprous children and another for the children of leprous parents.

But Dr. Rose was not content with the alleviation of the sufferings of his patients. He took a wider view and aimed at the control and ultimate eradication of leprosy. In spite of considerable opposition and indifference on the part of the public and the authorities he succeeded in establishing a number of leprosy clinics all over the colony, so that early non-infectious cases might be treated and discharged cases kept under supervision. Although he had no medical assistant he so organised his work in the Leper Hospital that he could be absent and attend these clinics. This entailed travelling long distances on rough roads, and it is not unlikely that the great strain of his double duties undermined his health and shortened his life.

In British Guiana segregation for leprosy is compulsory, but the law had seldom to be put into force as patients entered the Leper Hospital voluntarily, attracted by the news of Dr. Rose's skill and sympathy.

Dr. Rose calculated that there are still in British Guiana about one thousand people suffering from leprosy, but there are few infectious cases that are not segregated and almost all were known to him and under his supervision and treatment. It may be said that leprosy in the Colony is today almost, if not entirely, under control. It will not be easy to fill Dr. Rose's place, but it is to be hoped that adequate provision will be made for continuing his many activities and carrying on his great work, for it is only by continuous care and supervision that control can be maintained till leprosy is entirely eradicated from the Colony.

(From an article by Dr. E. Muir in the *Caribbean Medical Journal.*)

BROADCAST ADDRESS—*They Walk Alone*

ROBERT G. COCHRANE, M.D.

The title of this series of broadcasts, speaking as it does of the condition of those who for various reasons, usually unjustly, have been ostracised from ordinary society, has possibly been inspired by that fine book, "Who Walk Alone,"

recently written by my friend Mr. Perry Burgess, President of the American Leprosy Foundation. In this book he depicts something of the agony of mind a man goes through when he discovers that he has leprosy. The central figure in the book is that of an American soldier who served in the Philippines and, years afterwards, discovered to his horror that he had leprosy and dared no longer live with others as an ordinary member of society. The case, of course, could be parallelled scores of times in this land of India, and in our hearts when we hear of sufferers from leprosy a deep sense of pity is aroused. Yet to be pitied is the last thing a person with leprosy wants. It is not sentimental expressions of compassion that are needed, but an understanding of the sufferers' position, an overcoming of our secret fear of such a person, and a giving up of the old practice of treating sufferers from leprosy as outcasts. These changes alone will enable men and women with leprosy to regain their self-respect and will encourage them with the hope that their return to social fellowship is possible, and is desired by their friends.

In introducing to you the subject of leprosy I have no intention of showing you that side of the subject which arouses pity and a sense of fear and horror. There has been more than enough of what some people would term "sob stuff" written about leprosy. Let me approach the subject from the angle that my listeners are understanding men and women who wish to know facts about leprosy and how they can co-operate in altering the mind of the public, and so pave the way to a more intelligent attitude towards the disease.

In approaching this problem the first thing of which we should try and rid our minds is what might be termed "the leper complex." Therefore, I make an appeal to all who hear this talk that they endeavour to refrain from using the word "leper." Such words as "LEPER" and "UNCLEAN" are relics of the middle ages and should be no part of our vocabulary. Let us, by all means, fight the disease, but let us not ostracise and stigmatise the person who has leprosy, for he is not cursed by God neither has he a disease which is the result of immoral living or other sins. Some may say one cannot get rid of the word "LEPER," for it receives sanction from sacred books, but it must be borne in mind that in early times when diseases were not differentiated as they are to-day, much that was called leprosy was not leprosy at all. Many of these diseases which were grouped under the name "Leprosy" were highly infective and hence leprosy was con-

sidered to be a deadly disease, from which no recovery was possibly except by Divine intervention. For this reason there was and is a great fear of leprosy. Another reason for the fear of leprosy is that it is in some forms a mutilating disease; but while that is true many of the worst deformities and ulcers are not infective and need not be shunned. How frequently persons with such ulcers are avoided and their wounds neglected, whereas if the usual cleanliness and care were used they could quite easily be treated in ordinary dispensaries and hospitals and leprosy institutions would not be besieged with cases for which they have not accommodation and which could be treated equally well elsewhere.

Now let me endeavour to pass on something of the findings of the past few years and so help you to understand that this is indeed a subject worthy of study, a disease possible of prevention, a campaign profitable to support.

The British Empire Leprosy Relief Association in this province through its various investigation units, and particularly as a result of its Child Investigation Centre, has contributed much towards elucidating some of the problems which have, up to now, been little understood. Evidence has been gradually built up indicating that leprosy is largely a disease which spreads among children, and that the adult seldom acquires it, and that while certain forms of leprosy are serious and dangerous particularly to children, much is innocuous and of no danger to the public. Childhood and overcrowding are the main factors in the acquiring of leprosy. Defective diet, as far as can be ascertained, plays little part in the acquirement of the disease, and the part played by diet in relation to the treatment of the disease has been over-emphasised. Air, food and water, as far as we know, play no part in transmitting the disease. As far as our present evidence goes it can only be acquired by persons, especially children, being in close contact with someone who has infective leprosy. If this contact is close and prolonged then the disease is acquired in a large percentage of children, but so low is the infectivity of leprosy that probably even under the most favourable conditions for infection 15—20 per cent. of children escape. Not only may some 15—20 per cent. of children who come into contact with leprosy escape the infection, but of all the children who acquire the disease at least 50 per cent. show a form which spontaneously recovers without treatment. We are now more able to recognize in children those types which are comparatively benign and those which are more serious and tend to develop into the rela-

tively dangerous and difficult cases to treat. If then much leprosy is benign—dangerous neither to the person with it nor to those around—it means that vast though the problem is looked at as a whole, there is a fair prospect, given adequate training of medical men and adequate resources, of bringing the disease under control. If every mother in India would resolve that no child must be handled or picked up by any person with leprosy this would do more than any other measure to bring the disease under control. While this statement is true it cannot be too strongly stressed that leprosy should not be looked upon as a disease with a social stigma. Not only is it encouraging to remember that probably 50 per cent. of all children who acquire leprosy throw off the disease before adult life is reached, but there are certain forms of leprosy which appear to be very severe yet clear up almost miraculously and that without treatment. When one realises that such spontaneous "cures" occur one can readily understand that if these forms are not recognized success may quite honestly be attributed to a drug or other form of treatment, and yet the form of treatment suggested may have nothing to do with the subsidence of the disease. Therefore, in all cases the important question is not just whether a person has leprosy or not but whether he has a serious form of the disease requiring immediate, intensive and expert treatment.

I am often asked, is leprosy on the increase or decrease in India? The answer is "Yes" and "No.". There are certain villages where leprosy is of negligible moment, whereas there are other villages where the incidence may be 5—6 per cent, 8 per cent. or even more. We are beginning to be able to say that given certain conditions leprosy is not likely to spread in a village, whereas under different conditions the disease is likely to increase. The main factors in the spread of the disease are: (1) the percentage of infective—or as we call them "open" cases in the village—and (2) the extent to which children are in close contact with such open cases. Remember that one open case coming into contact with many children may be more responsible for the spread of the disease than a greater number of open cases not in contact with children. It cannot be too strongly emphasised that you as a healthy adult are very unlikely to acquire leprosy, but for goodness sake shield your children from infection, and if there is a known case of leprosy in your house, street or village, if you value child-life let him not handle, touch or have any dealings with children.

You will note I have said very little about treatment. I

have purposely avoided doing so because leprosy, though easy to prevent, is, if it develops seriously, difficult to treat. Yet in the hands of those who understand and have studied the disease the results of treatment are not discouraging. During the past six years in the Lady Willingdon Leprosy Sanatorium the discharge rate among the more serious forms of the disease has increased more than eight-fold. Relapses do occur all too frequently, but there is considerable hope of recovery if intensive treatment is commenced early.

Finally, a few hints to those who wish to share in the fight against this disease:—

1. FOR DOCTORS. If a doctor, try and get some special training so that you will come to understand the disease better and develop a real interest in its prevention and treatment.

2. FOR OTHERS. (a) If you, or anyone you know, has the disease, do not resort to remedies which claim dramatic cures, for dramatic improvement in leprosy is deceptive. Remedies which show steady progress are more reliable than those others which appear to give remarkable results. Only those who understand all the vagaries of leprosy can properly appraise the value of any given remedy.

(b) If a person has been declared non-infective by a competent authority and capable of mixing with the public without danger, do not penalise the person or dismiss him from employment or ostracise him, but let him live and work as a normal individual in society. Remember to have had leprosy is no more of a disgrace than to have had measles, and of the two, measles is much more infective.

3. FOR THOSE WHO SUFFER FROM LEPROSY.
Here are some simple rules:—

(a) Keep away from children.

(b) Make arrangements to sleep apart from other people and keep all clothes or personal utensils separate from those of the others in the house.

(c) Seek medical advice and, if necessary, adequate intensive treatment.

I trust that those who have had the patience to listen to this broadcast will realise that our knowledge of the disease is steadily growing. Those who have the privilege of waging warfare against this age-long disease are determined to carry on

in spite of limited resources and in spite of the difficulties of the present international situation, for this warfare will continue long after the present world conflagration has ceased. We are studying the disease in the child, we are studying it in the village environment, we are studying it in the institution and colony, but we need men of good will everywhere to co-operate to their utmost, so that in the not too distant future the day may dawn when this fair land will no longer be haunted by the fear of leprosy, and when we shall understand the disease more fully and have taken effective measures to banish it from our midst.

(With acknowledgments to the All India Radio, Trichinopoly.)

REVIEWS

Leprosy in India, 1942.

War restrictions have prevented us publishing full extracts of the recent papers in "Leprosy in India" and only a few of the more important can now be dealt with. The following recent Calcutta investigations on lepromin are most deserving of notice:

Dharmendra and Lowe (*Leprosy in India,* 1942, Jan. p. 3) report on the results of the Mitsuda test in cases of Leprosy of Different Clinical Types in 660 cases. Among 141 lepromatous cases, in 90 per cent. the reactions were negative, in 10 per cent. weak and in 0 per cent. positive. In doubtful cases 60 per cent., in neural (simple) 22 per cent., in neural (anesthetic) 9 per cent., and in neural (tuberculoid) 6 per cent. were negative, and positive reactions were obtained in 8, 43, 73 and 75 per cent. respectively; the remaining cases gave weakly positive results. Thus the reactions in nerve cases, as a whole, increase with the amount of activity as demonstrated by thickening of the lesions, so they are of some value in prognosis.

Dharmendra, Lowe and Mukherji (*Leprosy in India,* 1942, July, p. 86) report on variations in the test in 180 cases of leprosy of the neuro-muscular type to ascertain the results of repeating the test in different circumstances. The second reactions proved to be weaker than the first in 105, stronger in 20 and similar in 55 cases. They noted a tendency for the reac-

tions to be stronger in the summer than in the winter months, and that subsidence in clinical activity is associated with a diminution in the reaction to lepromin.

The same workers (*Ibid* p. 93) report attempts to increase the reaction to lepromin in cases of leprosy by repeated testing. Lepromin tests were repeated monthly, usually for a total of 5 to 15 injections, in 27 neural cases with no change in 9, slightly weaker ones in 10 and slightly stronger ones in 8. Similar trials in 62 lepromatous cases, which initially had given negative results in 58 and weak ones in the remaining 4, showed no change in 47 and slightly stronger ones in only 2. They were therefore unable to confirm earlier reports of Bargehr that by this means negative reactions to lepromin could be converted into positive ones.

Dharmendra (*Leprosy in India,* 1942, October, p. 122) reports on the preparation of a bacillary antigen standardised by weight. Hitherto, suspensions from leprosy nodules contained some tissue elements in addition to the bacilli, but the latter have now been obtained in a pure form. Two grammes of nodules from the ears, after sterilisation in an autoclave, are ground in a mortar with 50 c.c. of chloroform repeatedly until a smear of the remaining tissues is almost free from bacilli. On evaporating off the chloroform on a water bath only bacilli and lipoids remain. The latter are dissolved in added ether and centrifuged to remove the lipoids, the deposited bacilli separated by the centrifuge and dried in a vacuum. Standard lepromin is prepared by dissolving 1 millegramme of the dried bacteria in 10 c.c. of carbol saline, and 0.1 milligramme used as the standard dose.

COLONIAL MEDICAL REPORTS

Annual Report for 1941 of the Central Leper Hospital, Makogai, Fiji.

Dr. C. J. Austin, the Medical Superintendent, reports further progress of this important Southern Pacific institution. During 1941, 59 cases of leprosy were admitted, 35 being neural and 25 lepromatous ones. The deaths were 34, and 47 were discharged after having been negative bacteriologically for two years and 45 more negative cases were awaiting examination

by the medical board; a good result among a total of 702 cases. By far the highest percentage of discharged cases were among the Cook Islanders, due to the larger proportion of early cases sent in by a doctor who had been trained at the leper settlement. Improved training in leprosy of medical practitioners is therefore required, together with regular inspection of school children and of all known contacts, if good results from treatment are to be obtained. The Indian admissions contained the largest proportion of advanced lepromatous cases, but in spite of this 154 (58.1 per cent.) of 290 of the lepromatous type showed improvement during the year, against 70.8 per cent. of the more favourable nerve cases. No less than 24 of the 39 deaths were due to leprosy, including those due to sepsis and gangrene, and 5 more were due to tuberculosis. Iodised chaulmoogra oil given intramuscularly and ethyl esters intradermally remains the routine treatment.

Jamaica Medical Department Report for Year ending 31st December, 1941.

Leprosy cases in the Home numbered 158 at the beginning, and 178 at the end of the year. Admissions numbered 31, 9 died and 2 absconded. Considerable improvements have resulted since five sisters of the Marist order arrived in 1940, but expansion is a matter of urgency.

Trinidad and Tobago Medical and Sanitary Report for 1940. (Published 30th January, 1942).

At the end of 1939, 377 patients remained at Chacachacare there were 44 new cases and 10 re-admissions, and the total number treated was 431. 19 deaths occurred. 8.57 per cent. 18 persons were discharged and 11 absconded.

Northern Rhodesia Medical Report for 1940.

One European leprosy case was notified and 109 Native cases.

Cyprus.

In 1940 the Leper Farm had 122 cases at the beginning of the year, 13 patients were admitted, 6 died and 8 were discharged on parole, leaving 121 at the end of the year.

In 1941 the admissions numbered 13, the deaths 5, and 16 were paroled, leaving 113 at the end of the year.