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EDITORIAL.

Nigeria presents much the greatest leprosy problem in the British Empire apart from India. From an early period BELRA has taken a special interest in the Nigerian problem, and in 1936 Dr. E. Muir wrote a valuable report, based on a long tour of the country, on the progress of anti-leprosy work in it, and advised with regard to its extension.

Since that time Dr. Davey, at the Uzuakoli Settlement in the Owerri Province, and Dr. Money at the Oji River Settlement in Onitsha Province, have greatly extended the work by means of large numbers of clinics established around the settlements, at which upwards of 10,000 patients are being treated in each case. Moreover, in the Owerri area more particularly, a large number of leper villages or hamlets have been constructed, under the supervision of the Settlement staff and at the cost of the Chiefs. In these most of the infective cases in the neigbourhoods concerned are voluntarily isolated and treated at a low cost, and many others are clamouring for the extension of these plans, the success of which has now been recognised by the Nigerian Government in a very practical way.

A scheme for an extension of anti-leprosy work in Nigeria has been sanctioned by the Colonial Office, under which an average of £50,000 will be expended in each of the next five years from money provided by the Colonial Development and Welfare Fund. A new leprosy department under specially recruited and trained medical men will take over and extend the work in the three provinces of Onitsha, Owerri and Benin. It has hitherto been carried on mainly by missionary staffs with financial aid from the Nigerian Government, the Native Administrations and BELRA, but has now got beyond the means of existing agencies. The Nigerian Government proposes to take it over and extend it in those provinces which have very high leprosy rates, and in which the confidence of the people has already been obtained to a degree that should ensure the continued success of methods which have been proved to be soundly based on recent advances in the knowledge of the epidemiology and treatment of the disease. Later it is hoped to extend the work to the Northern and other, less affected, provinces of Nigeria. It is now acknowledged that leprosy can be materially reduced within a period of about ten years in any area in which the whole-hearted co-operation of the people has been secured.

Nigerian experience has established the soundness of the

methods of leprosy prophylaxis and treatment advocated by BELRA during the past two decades, and their success opens up an almost unlimited field for the extension of the settlement, clinics and leper village method of control throughout the rest of West Africa and through the almost untouched and immense leprosy infected countries of East Africa, from the Southern Sudan down to Tanganyika and Nyasaland. Many more workers and large funds will be required and these can be appealed for with the assurance that they can be successfully applied to the reduction of leprosy in the infected countries of the Empire.

RECHERCHES SUR L'ACTIVITE THERAPEUTIQUE DE L'HUILE ESSENTIELLE DE CITRONNELLE DANS LA LEPRE.

J. DEGOTTE.

Il est généralement admis que les médicaments les plus actifs dans la thérapeutique spécifique de la lèpre sont l'huile de chaulmoogra et ses dérivés : ethylesthers, savons sodiques des divers acides gras et notamment le plus utilisé dans la Colonie le gynocardate.

Comme on le sait on groupe sous la dénomination d'huile de chaulmoogra les huiles provenant des graines de diverses espèces de flacourtiacées et principalement des hydnocarpus wightiana et anthelmintica. Depuis longtemps on avait signalé que les beurres extraits des graines de plusieurs flacourtiacées congolaises (caloncoba welwitchii et caloncoba glauca et lindakeria dentata) contenaient également des éther glycériques des acides hydnocarpique et gynocardique et par conséquent pouvaient être employés comme huile de chaulmoogra.

Les médicaments que nous employions à Pawa avant 1940 étaient tous d'origine étrangère. Les quelques hydnocarpus wightiana que nous possédions ne pouvant produire que quelques litres d'huile par an. Les ennuis de l'extraction n'étaient pas compensés par l'obtention d'une quantité minime et avaient fait abandonner l'idée de l'utilisation de ce produit.

A la suite de la déclaration de la guerre, prévoyant la raréfaction progressive de l'huile de chaulmoogra, nous nous mîmes en devoir de presser les graines de nos arbres ainsi que toutes celles de caloncoba que pûmes recolter en forêt. Mais bientôt je dus reconnaitre qu'il était impossible d'obtenir une

quantité suffisante d'huile pour pouvoir traiter régulièrement et activement 2000 lépreux. Je cherchai dès lors un produit de remplacement préparable sur place.

L'eucalyptol ayant été vanté par de nombreux auteurs retint d'abord mon attention mais les petites quantités de feuilles dont je pouvais disposer me firent abandonner cette voie.

Me figurant que l'activité thérapeutique des acides chaulmoogriques pouvait résider dans le noyau cyclique en C 5 contenu dans leur molécule, je cherchai
formule chimique contenait un tel noyau bien que l'après certains auteurs le poids moléculaire seul joue un rôle appreciable. C'est ainsi que mon attention fut retenue par le camphene dont le noyau en C 7 peut être cinsidéré comme dérivé d'un noyau initial en C 5 ainsi qu'on peut le voir la formule ci-après :

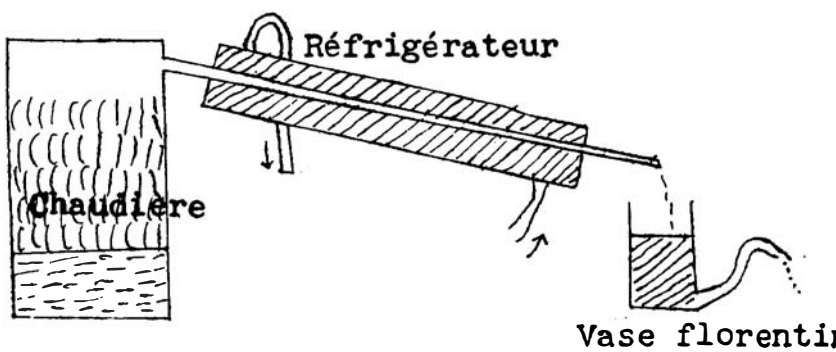
```
H2=C   —   C—H   —   C=(CH3)2
  :        :          :
  :        :          :
  :        C=H2       :
  :        :          :
H2=C   —   C—H   —   C=CH2
```

Ce corps existant à l'état naturel dans l'essence de citronnelle (plante extrêmement commune dans la région) je préparai une quantité suffisante de cette huile pour effectuer une distillation fractionnée, mais arrêté par un manque d'appareil, j'essayai l'essence de citronnelle pure et obtins les résultats ci-après

(*a*) *Préparation de l'essence de citronnelle.*

Les citronnelles appartiennent à la famille des gramnees et au genre Cymbopogon, elles poussent très facilement dans l'Est de la Colonie où on les emploie pour border les routes.

Les feuilles grossièrement découpées sont introduites dans un alambic, l'huile est entrainée par la vapeur d'eau. La vapeur condensée est récoltée dans un vase appelé vase florentin



qui sépare l'eau et l'huile par différence de densité l'eau s'élimine au fur et à mesure de son arrivée (voir croquis).

(*b*) *Constitution chimique de l'huile.*

L'huile essentielle obtenue par la méthode décrit ci-dessus contient 65% de ce que l'on est convenu d'appeler dans le commerce des parfums (l'essence de citronnelle est employée dans l'industrie des parfums) GERANIOL, et qui est constitué par, un mélange de géraniol, citronnellol, citral et citronnellal. Les 35% restant contiennent des produits terpéniques parmi lesquels se trouve le camphène.

(*c*) *Action chez l'animal.*

Le cobaye d'un poids moyen de 450 grs. supporte sans troubles apparents une dose totale de 1 gr. d'essence par semaine en deux injections de 50 ctgrs. chacune.

La solution huileuse contenant plus de 10% d'essence est irritante pour les tissus et provoque aisément des eschares si elle est injectée dans le derme.

La stérilisation se fait par chauffage une heure au bain marie.

(*d*) *Dose thérapeutique chez l'homme.*

Afin de diminuér l'irritation j'ai utilisé une solution dans l'huile de coton à raison de 10 parties d'essence pour 90 parties d'huile de coton. La première dose injectée fut de 10 ctgrs. d'essence soit un cc. de solution dans le derme; je la répartis en une vingtaine de papules de 5 mm. de diamètre environ, dans une macule neurale simple. Un mois après constatant que les endroits injectés avaient repris la teinte normale de la peau, je m'enhardis à injecter la préparation sous la peau puis dans le muscle. Le médicament semble être d'une innocuité absolue.

Les traitements sont actuellement constitués comme suit :

1 ère semaine	1 cc.	soit	10 ctgrs. d'essence
2 ème semaine	2 cc.	soit	20 ctgrs. d'essence
3 ème semaine	3 cc.	soit	30 ctgrs. d'essence

9 autres semaines 3 cc. par semaine.

Après 15 jours de repos nouvelle cure.

Les lépreux de toutes formes supportent en général très bien ces injections, les indurations sont rares. Beaucoup de malades déclarent ressentir un bien-être général après la piçura tandis que d'autres accusent un léger besoin de sommeiller. Aucune intoxication n'a été remarquée jusqu'à présent.

Des doses plus fortes de 60 ctgrs. chacune données trois fois

par semaine deux semaines de suite, avec un repos de 15 jours entre deux séries, nous semblent être dangereuses, non pas chez les neureux mais surtout chez les lépromateux qui ont une tendance á empirer dans beaucoup de cas le montre le tableaux n° 2. Cela est peutêtre dû à une libération trop forte des toxines microbiennes qui provoquent un choc anergique préjudiciable au malade.

Les traitements en masse que nous rapportons ci-après ont été entrepris depuis janvier, 1943. Beaucoup de nos malades avaient reçu sans succès bien appréciables de l'huile de chaulmoogra. Un certain nombre enfin n'ont reçu que de l'essence de citronnelle.

Tableau n° 1. Traitement par dose hebdomadaire de 30 ctgrs.

Formes de la maladie	Traités	Lésions disparues	Améliorés	Stabilisés	Empirés	Décès
Ns 1	153	32	17	86	8	10
Ns 2	197	5	15	162	10	5
Ns 3	200	1	6	180	10	3
Na 1	65	2	—	52	7	4
Na 2	160	—	—	142	3	15
Na 3	90	—	—	80	—	10
Nst 1	14	2	5	6	—	1
Nst 2	8	1	1	6	—	—
Nst 3	5	—	—	4	—	1
Ns 1 Na 1	17	4	2	9	1	1
Ns 1 Na 2	1	—	1	—	—	—
Ns 1 Na 3	1	—	1	—	—	—
Ns 2 Na 1	122	2	8	105	4	3
Ns 2 Na 2	90	2	13	70	2	3
Ns 2 Na 3	20	—	1	17	—	2
Ns 3 Na 1	183	1	16	154	5	7
Ns 3 Na 2	83	4	6	68	—	5
Ns 3 Na 3	14	—	—	11	—	3
Nst 1 Na 1	1	—	—	1	—	—
Nst 2 Na 1	2	—	—	2	—	—
Nst 2 Na 2	1	—	—	—	1	—
Nst 3 Na 1	3	—	1	2	—	—
Ns 1 rés	36	9	3	18	3	3
Ns 2 rés	37	9	1	23	4	—
Ns 3 rés	9	1	—	7	1	—
Ns 1 rés Na 1 ...	10	3	1	4	1	1
Ns 1 rés Na 2 ...	2	—	—	2	—	—
Ns 1 rés Na 3 ...	2	—	1	1	—	—
Ns 2 rés Na 1 ...	42	7	3	27	4	1
Ns 2 rés Na 2 ...	45	2	7	32	1	3
Ns 2 rés Na 3 ...	13	1	2	8	—	2
Ns 3 rés Na 1 ...	17	2	2	9	2	2
Ns 3 rés Na 2 ...	15	—	1	11	—	3
Ns 3 rés Na 3 ...	1	—	—	1	—	—
Totaux	1659	90	114	1300	67	88

Formes N t et N T.

Formes de la maladie	Traités	Lésions disparues	Amélio-rés	Stabilisés	Empirés	Décès
Nt 1 mineure ...	78	12	10	53	—	—
Nt 2 „ ...	32	2	10	19	1	—
Nt 3 „ ...	9	—	2	7	—	—
Nt 1 Na 1	3	—	—	3	—	—
Nt 1 Nt 2	2	1	1	—	—	—
Nt 1 Na 3	1	—	—	1	—	—
Nt 2 Na 1	15	—	1	11	—	—
Nt 2 Na 2	8	—	—	5	—	3
Nt 3 Na 1	4	—	3	1	—	—
Nt 3 Na 2	4	—	—	4	—	—
Nt 3 Na 3	1	—	—	1	—	—
Nt 1 rés	6	1	1	4	—	—
Nt 2 rés	4	1	—	3	—	—
Nt 1 rés Na 1 ...	2	—	—	1	—	1
Nt 2 rés Na 1 ...	1	—	1	—	—	—
Nt 2 rés Na 2 ...	2	—	—	2	—	—
Nt 3 rés Na 1 ...	2	—	2	—	—	—
NT 1 majeure ...	31	—	4	24	2	1
NT 2 „ ...	23	1	7	14	—	1
NT 3 „ ...	9	—	1	8	—	—
NT 1 Na 1	2	—	—	1	—	1
NT 2 Na 1	3	—	1	2	—	—
NT 2 Na 2	3	—	—	3	—	—
NT 2 Na 3	1	—	—	1	—	—
NT 3 Na 1	2	—	—	1	—	1
NT 3 Na 2	2	—	1	1	—	—
NT 1 rés	2	1	—	1	—	—
NT 2 rés	2	—	1	1	—	—
NT 2 rés Na 1 ...	2	—	—	2	—	—
NT 2 rés Na 3 ...	1	—	—	1	—	—
Totaux	257	19	46	180	3	8

Formes L.

Formes de la maladie	Traités	Lésions disparues	Amélio-rés	Stabilisés	Empirés	Décès
L 1	5	—	—	4	—	1
L 2	6	—	—	5	—	1
L 3	10	—	—	9	1	—
Ld 1	10	—	1	9	—	—
Ld 2	54	—	6	44	2	2
Ld 3	53	—	12	39	1	1
L 1 Ld 1	8	—	—	6	2	—
L 1 Ld 2	19	—	4	10	2	3
L 1 Ld 3	11	—	—	9	2	—
L 2 Ld 1	1	—	—	1	—	—
L 2 Ld 2	29	—	1	23	1	4
L 2 Ld 3	20	—	5	14	1	—
L 3 Ld 1	1	—	—	1	—	—
L 3 Ld 2	6	—	1	5	—	—
L 3 Ld 3	5	—	—	4	1	—
L 1 Na 1	2	—	—	1	—	1

Formes de la maladie	Traités	Lésions disparues	Amélio-rés	Stabilisés	Empirés	Décès
L 2 Na 1	3	—	—	3	—	—
L 2 Na 2	4	—	—	4	—	—
L 2 Na 3	1	—	—	1	—	—
L 3 Na 1	2	—	1	1	—	—
L 3 Na 2	2	—	—	1	—	1
Ld 1 Na 1	3	—	—	—	3	—
Ld 2 Na 1	24	1	4	11	1	7
Ld 2 Na 2	9	—	3	5	—	1
Ld 2 Na 3	1	—	1	—	—	—
Ld 3 Na 1	18	—	4	10	1	3
Ld 3 Na 2	10	—	1	8	—	1
Ld 3 Na 3	1	—	1	—	—	—
L 1 Ld 1 Na 1 ...	1	—	—	1	—	—
L 1 Ld 1 Na 2 ...	1	—	1	—	—	—
L 1 Ld 2 Na 1 ...	7	—	—	7	—	—
L 1 Ld 2 Na 2 ...	4	1	1	2	—	—
L 1 Ld 3 Na 1 ...	7	—	1	6	—	—
L 1 Ld 3 Na 2 ...	4	—	1	1	—	2
L 2 Ld 2 Na 1 ...	10	—	3	6	1	—
L 2 Ld 2 Na 2 ...	8	—	1	7	—	—
L 2 Ld 3 Na 1 ...	6	—	—	5	—	1
L 2 Ld 3 Na 2 ...	4	—	—	4	—	—
L 3 Ld 2 Na 2 ...	3	—	1	2	—	—
L 3 Ld 3 Na 1 ...	4	—	—	4	—	—
L 3 Ld 3 Na 2 ...	2	—	—	1	—	1
Totaux	379	2	54	274	19	30

Tableau n° 2. Traitement par fortes doses de 6 cc.

Formes de la maladie	Traités	Lésions disparues	Amélio-rés	Stabilisés	Empirés	Décès
Ns 2	1	—	—	—	1	—
Ns 3	3	1	1	1	—	—
Ns 2 rés Na 2 ...	1	1	—	—	—	—
Totaux	5	2	1	1	1	—

Formes N t et N T.

Nt 1 mineure ...	1	1	—	—	—	—
Nt 2 „ ...	1	—	—	1	—	—
Nt 3 Na 1	1	—	—	1	—	—
NT 2 majeure ...	1	—	—	1	—	—
Totaux	4	1	—	3	—	—

Formes L.

L 3	1	—	1	—	—	—
Ld 2	1	—	1	—	—	—
Ld 3	1	—	1	—	—	—
L 1 Ld 2	2	—	—	—	2	—

Formes de la maladie	Traités	Lésions disparues	Améliorés	Stabilisés	Empirés	Décès
L 1 Ld 3	1	—	—	1	—	—
L 2 Ld 2	3	—	2	1	—	—
L 2 Ld 3	2	—	—	1	1	—
L 3 Ld 3	1	—	—	1	—	—
L 3 Na 2	1	—	—	—	—	1
Ld 1 Na 1	1	—	—	1	—	—
Ld 3 Na 1	2	—	1	1	—	—
Ld 3 Na 2	1	—	1	—	—	—
L 1 Ld 2 Na 1 ...	1	—	—	1	—	—
L 1 Ld 3 Na 1 ...	1	—	—	—	1	—
L 2 Ld 3 Na 1 ...	3	—	—	3	—	—
L 3 Ld 3 Na 1 ...	2	—	1	—	1	—
Totaux	24	—	8	10	5	1

(e) *Durée de l'action thérapeutique.*

L'action thérapeutique semble se prolonger car six malades n'ayant reçu que de l'essence de citronnelle, mis en observation hors traitement en 1941 par suite de la disparition de leur macules, sont après deux ans sans nouveaux symptômes apparents.

(f) *Prix de revient des traitements.*

Le prix de revient des traitements est extrêmement bas et permet par le fait même de traiter un nombre très important de malades avec des crédits restraints.

L'huile essentielle coûte sur le marché environ 170 frs le litre, l'huile de coton par petite quantité revient à environ 6 frs le litre, de cette façon 10 litres de produit à injecter coutent :

essence de citronnelle	un l.	170.—
huile de coton	neuf l.	54.—
		224.—

soit 0,067 fr. par injection de 3 cc.

L'essence de citronnelle dont je me suis servi pour une partie de mes expériences provenait des plantation de la Compagnie de l'Uele à Kurukwata par Aba.

CONCLUSION.

Sans vouloir faire de l'essence de citronnelle une panacée destinée à guérir tous les lépreux en un temps record, je crois cependant être en droit d'affirmer que son activité est comparable à celle de l'huile de chaulmoogra ainsi qu'on peut en juger par les résultats obtenus dans nos léproseries des trois dernières années.

(*a*) *Traitement par l'huile de chaulmoogra formule Peirier.*

	Traités	Symptômes disparues	Améliorés	Statu quo	Empirés
1941	1.623	68	126	1.391	38
1942	2.169	101	125	1.770	173

(*b*) *Traitement par essence de citronnelle.*

1943	2.328	114	223	1.763	95

SUMMARY.

Owing to war time difficulty in obtaining chaulmoogra oils the author sought for an oil of somewhat similar constitution as a substitute, and turned to the essence of citronella, which is obtainable from a very common Congo plant. A quantity of the oil from the Congo plant of the family Cymbopogon was distilled, the condensed vapour collected and the oil separated by its density from the water of distillation and diluted one part with nine of cotton seed oil to reduce its irritant properties on injection under the skin, or intramuscularly. The doses are 1 c.c. in the first week, 2 c.c. in the second and 3 c.c. in subsequent 10 weeks, after which 15 days interval is allowed before continuing the injections. Stronger doses proved harmful in lepromatous cases. The results are detailed in the tables, from which the author concludes that without claiming the treatment to be a panacea against leprosy, he feels justified in asserting that the essence of citronella is comparable in its effects with those obtained with chaulmoogra oils as judged by the results obtained in the Congo leprosaria during the last three years.

LEPROSY IN ANTIGUA.

REPORT on 2nd visit to Antigua, from 4th to 15th July, 1944. The first visit was from 28th January to 3rd February, 1942, the Report of which was published in *Leprosy Review*, January, 1943, pp. 33.

E. MUIR.

Since my visit to Antigua two and a half years ago, progress has been made in the control of leprosy. The staff has been improved at the Leper Home, and there has been more follow-up of contacts leading to earlier segregation of infectious cases. This report should be read in conjunction with the previous one.

The following table shows in classification according to type the numbers of male and female lepers under segregation in the Leper Home in 1942 and in 1944 :—

	1942.			1944.		
Types.	Male.	Female.	Total.	Male.	Female.	Total.
N-1	1	0	1	0	0	0
N-2	3	1	4	2	0	2
N-3	4	2	6	5	1	6
L-1	0	2	2	2	2	4
L-2	0	0	0	7	2	9
L-3	9	7	16	14	5	19
Arrested ...	3	5	8	3	5	8
TOTALS ...	20	17	37	33	15	48

Deducting the arrested cases for each year, there are 40 active cases in 1944 as compared with 29 in 1942, an increase of 38 per cent. The increase is chiefly in the less advanced lepromatous (open) cases under L-1 and L-2, of which there are 13 as compared with 2, suggesting that open cases are being detected in the earlier less conspicuous stage. The increase in the number of active cases might mean an increase of the disease in Antigua, but it might also mean that more care is being taken in the follow-up of known cases. It should be noted that while the number of active male cases has increased from 17 to 30, that of active female cases has diminished from 12 to 10.

There are also 27 cases who are or will be placed under treatment outside the Leper Home, being closed cases of the neural type; one open case is being admitted to the Leper Home; 14 arrested cases live in their own homes and are inspected from time to time.

This makes a total of 90 known cases but, judging from the number discovered during my visit, there are likely to be others who have not yet been detected.

LEPER HOME.

Staff. Recently a Matron trained for two years at Chacachacare has been appointed, and, as recommended in my last Report, a male attendant. A new Master has also been appointed. There are 3 female nursing assistants, 2 cooks, a scullery maid and a laundress. The male attendant lives in town and cycles out to the Home three times a week. He should have a two-room house beside the Home so that he can give more time to his duties.

I understand that the question of the pay of the nursing assistants, of which there are three, of the laundress, and of the three servants who cook and serve the food, is to be considered

by a Wage Commission. Those working in a leprosy institution are always at a disadvantage, as such work prejudices against later employment elsewhere. Also the remoteness of the Home makes conditions difficult. These circumstances should be considered in revising their pay. Once the male assistant has a house in the neighbourhood of the Home and can work six days a week, one of the female nursing assistants might be dispensed with. When suitable ex-patients are available, or even suitable closed cases in which the disease is improving, but not yet arrested, they might be employed in the place of subordinate staff.

Buildings.

(1). House for the Male Attendant. This is most urgently required. A two roomed cottage with accessories should suffice.

(2). Female Staff Quarters. A two storey building is suggested, with common-room and two double rooms for cooks and laundress below, and rooms for the Matron and two nursing assistants above.

(3). Administrative and treatment quarters are badly needed, the present accommodation being quite inadequate and unsuitable.

Diet. The diet is as follows:—

1. Meat or fish five days a week, with pea soup as a substitute on Tuesdays and Fridays.
2. Fresh Milk, 6 ounces daily.
3. Butter, 2 ounces, and pig fat or oil 12 ounces a week.
4. Bread, 8 ounces daily.
5. Rice, ground provision or cornmeal, 6 ounces daily.
6. Sugar, 4 ounces daily.
7. Grape-fruit once a month, lemons occasionally, mangoes abundant in season, occasional boiled greens.

This diet seems to be adequate, both as regards calories and body building materials. The only defect appears to be in green vegetables and fresh fruit; but it is not clear why this should be so, as the patients have gardens and abundance of greens and tomatoes should be raised. I hear that the patients sell their vegetables and eggs outside the Home; this should not be allowed.

Finance. The expense to Government for each patient is about £52 a year, of which about £24 goes to food. From the financial as well as the public health point of view it is important therefore to control leprosy as speedily as possible.

Social Welfare. As in many other Leper Homes the patients

take up the attitude that as Government has segregated them compulsorily so Government must do everything for them. They therefore refuse to do any work for which they are not paid. There is truth in their argument, seeing that they are sentenced in what amounts to jail conditions for long periods, often for life, without having committed any crime against the community. In fact it is the community that has committed a crime against them by infecting them with leprosy. But a cheerful, willing attitude toward life, and open air exercise, such as is best afforded by work in the fields, are essential for their mental and physical well-being, and without these there is little hope of recovery or improvement.

The difficulty in an institution like that in Antigua, is that the small number of patients does not permit of a whole-time superintendent of high standing. Also the medical care of the patients is only a small fraction of the duties of the visiting Medical Officer, who has to attend also to all his dispensaries and other medical duties.

The Home therefore suffers from the lack of the constant supervision of an officer of higher education and experience such as would be supplied in a larger institution. The present staff of Master, Matron and Male Attendant, have not the necessary standing and experience to influence the patients and lead them along the right lines. They are worried and harried by the patients and an atmosphere of discontent and ill-will is created.

It has been suggested that small Leper Homes should be replaced by a central institution for the British West Indies. This suggestion has been considered from time to time, but there are considerable difficulties in the way. The Trinidad Government has given consent to a limited number of lepers being admitted from the other Colonies to Chacachacare, but only those would be admitted who came voluntarily and in whom there was a prospect of recovery under treatment. As removal to a distant Colony would mean complete cutting of connections with home and relatives for a number of years and perhaps for life, it would be difficult to obtain the consent of more than a limited number to such exile. Also there would be a large proportion still left in each Leper Home, a remnant of the most hopeless and discontented, who would still have to be looked after, making the overhead charges per patient even larger than at present.

Another suggestion is that while the present whole-time staff fail at present adequately to influence the patients in spite of their best efforts, they might succeed better with the outside help of an honorary visitor, provided someone of experience, standing and sympathy, were willing to give such help. Such a

visitor would be in touch with patients and staff and be able to trace the causes of friction and misunderstanding, and suggest solutions. The visitor would also be in touch with the outside world and be able to enlist others who would like to give useful help, but do not know how, and arrange for entertainments and other amenities for the patients. The visitor might also obtain help from the agricultural, educational, and other departments when required, and could be consulted by the Medical Department in matters concerning the welfare of the patients.

Other Suggestions. One of the chief difficulties in running the Leper Home is its remoteness and the difficulty of communications. This makes it difficult for the patients' friends to visit them, difficult to bring supplies, and difficult for the staff to get to town. I suggest that there be definite visiting days for patients' friends, twice a week between certain hours, and that a truck or other suitable vehicle be run from St. John's to take them to the Home and back, supplies also being brought from town at the same time. The limiting of visiting hours would be an advantage in respect of public health, as at present relatives come at any time they please, sometimes eat with the patients and even spend the night in their quarters.

No healthy children of under sixteen should be allowed into the Home at any time, nor should patients be allowed to wander into surrounding villages, or sell their agricultural, dairy and other produce to people outside the Home.

The patients are very ignorant of leprosy, its nature and how it is spread. The staff do their best to enlighten them, and I spent some time explaining these matters to them. But regular periodic talks on leprosy and other health subjects should be arranged, as it is only by the repetition of facts in new, interesting and impressive ways, and especially by people from outside of recognised standing, that their superstitions, taboos and prejudices can be removed.

LEPROSY CONTROL.

There is reason to believe that there are now fewer open cases outside the Home than on my former visit. But leprosy often takes as much as 10 years to come; contacts must be listed and examined if the disease is to be brought under control.

I gave four lectures, one in St. John's and three in country centres, all of which were well attended by interested audiences. It would appear that there is large scope for health education by this and similar methods.

Changes have recently been made in the Leper Act and Rules along the lines recommended in my former Report.

Arrangements should be made for free treatment of early closed cases at suitable centres. Under medical supervision nurses trained for the purpose might give the injections. The intradermal injection of lesions in these cases has not yet been widely used; by this method many cases both in the Leper Home and outside could be quickly cleared up.

ACKNOWLEDGMENTS.

This study has been made under the auspices of the Controller of Development and Welfare in the British West Indies and his Medical Adviser. I wish to acknowledge the interest taken by H.E. the Governor of the Leeward Islands, and to thank especially the Federal Senior Medical Officer for his hospitality, kindness and help during my visit to Antigua.

LEPROSY IN ST. KITTS AND NEVIS.

REPORT on second visit to St. Kitts and Nevis from 15th to 25th July, 1944. The first visit was in February, 1942, the Report on which was published in the *Leprosy Review* of January, 1943, page 29.

E. MUIR.

Since my visit to St. Kitts and Nevis in 1942, eleven cases of leprosy have been admitted to the Leper Home and ten are recorded as having died in the Home. Of the eleven admitted, four are lepromatous (3L-3 and 1L-2), the rest being neural. There are about 27 known active cases (12 male and 15 female) outside the Home, of which 7 or 8 are open lepromatous cases. At least 3, however, of the latter have only recently been detected and will be admitted to the Home as soon as possible. The remaining open cases are isolated at home, but I think that greater care should be taken to ensure that they conform to strict rules and are not a danger to their families and the community. During my visit I gave a talk on leprosy to the Medical Officers, which was also attended by Sanitary Inspectors and Nurses, also three public meetings at Basseterre, Charlestown and Sandy Point were well attended.

LEPER HOME.

Staff and Buildings. The new Master mentioned in my last Report, was appointed after spending a period of training at the Chacachacare Leprosarium; he appears to be doing good work for

the benefit of the patients. The staff quarters are situated on the old fort wall to the entrance side of the Home, but the only exit for the staff is through the common gate used by the patients. I consider that a separate stair should be erected communicating directly with the outside. The Master's quarters consist of two rooms, quite adequate for a bachelor, but too small for a married man. They might be extended by adding the room at present used as an office, the office being accommodated next to the surgery. The surgery also is inadequate and a treatment room with running water is badly needed.

The patients' quarters are placed in two compounds for males and females respectively. Each patient has a small cottage and these on the whole are clean and tidy.

Patients' Gardens. Adjoining the Home is an area of ground, two acres in extent which is cultivated by some 20 of the more able-bodied patients, each having either a separate plot, or three or four having a combined garden. This affords healthy exercise, so important in treatment, and at the same time supplies fresh vegetables most necessary for the patients' diet. The land, however, is insufficient and the area should be doubled, if possible by buying another two acres of adjoining land. Care should be taken, however, that produce is not sold by the patients to outside healthy people. In fact, while the site of the Leper Home is in itself excellent in most respects, it has one great disadvantage in being too near the village of Sandy Point and adequate precautions should be taken to prevent the spread of infection by intercourse between patients and villagers.

Treatment. Several of the patients with neural leprides might be cleared up by the use of intradermal injections of suitable hydnocarpus preparations. Moogrol, the only preparation at present available, is too irritant for this purpose, and arrangements are being made for the supply of pure hydnocarpus oil, the supply of which from India has been difficult during the War.

Types of Cases. The following table gives a comparison of the numbers and types of cases as found during my two visits: —

	1942.			1944.		
Types.	Male.	Female	Total.	Male.	Female.	Total.
N-1	0	0	0	1	0	1
N-2	4	3	7	2	1	3
N-3	2	2	4	6	4	10
L-1	1	0	1	0	0	0
L-2	0	2	2	1	0	1
L-3	14	10	24	14	12	26
Arrested ...	4	4	8	4	4	8
TOTALS ...	25	21	46	28	21	49

It will be noticed that the number of arrested cases remains the same. Three of these are fit for discharge, but the remainder are so deformed that they will require to remain as permanent residents. Of the neural cases, several can be cleared up by the means mentioned above in a few months or years. The number of lepromatous open cases remains the same, being from 66 to 71 per cent. of all active cases.

I was asked to make a survey of the eye conditions of the patients. Of the lepromatous cases in which the eye ball is invaded by the bacilli, I found that the eyes of 16 were affected out of 26, being about 62 per cent. The signs varied from sluggish or fixed and irregular pupils to complete destruction of the eye. In some there was principally corneal invasion, but in most there was a massive nodular invasion from one or more angles involving cornea, uveal tract and iris. Out of the 18 "N-3" and arrested cases there were different degrees of involvement of the eyelids in 10 cases. Anaesthesia of the cornea, along with inability to close the eyelids removes the natural protective mechanism of the front of the eyeball. In two cases ulceration of the cornea had begun.

OUTSIDE PATIENTS.

I have mentioned above the number of these, a few new cases being found during my visit. Several of the neural cases among them can be cleared up by means of intradermal injections in a short time, and arrangements should be made for this either at their homes or in suitable centres. The fact that some fresh cases were found during my short visit strengthens the surmise that there are still active cases undetected. During the last 30 years, 146 cases have been admitted to the Leper Home, of which 78 were open lepromatous cases. Examination of the records of those admitted from the small island of Nevis during varying periods is shown in the following table:—

Period.	Length of Period.	Number of cases.
1893-1917	24 years	3
1919-1920	2 ,,	12
1923-1927	5 ,,	6
1928-1930	3 ,,	12
1931-1937	7 ,,	3
1938-1940	3 ,,	5 (all L-3).
1942-1943	2 ,,	3

From this it appears that the disease appears in waves, only a few being detected between the crests of waves. This may, of course, be due to greater vigilance of medical officers at certain periods, but a more likely explanation is that the quiescent

intervals corresponded with the prolonged incubation of lepromatous cases which may often last from 5 to 10 years. This suggests that there may be at the present time a not inconsiderable number of such latent cases and vigilance is necessary so that they may be detected as soon as possible before they have time to spread infection to another generation.

ACKNOWLEDGMENTS.

This survey has been made under the auspices of the Controller of Development and Welfare in the British West Indies, and his Medical Adviser.

I wish particularly to thank Dr. Griffin, the Federal Senior Medical Officer, who accompanied me from Antigua and greatly aided the investigation, also Dr. McLean, the Medical Officer in Charge of the Leper Home, for his hospitality and help in examining cases in the Home and outside.

SECOND REPORT ON LEPROSY IN JAMAICA.

E. MUIR.

My second visit to Jamaica to study leprosy and advise on measures for its relief and control, was made at the request of the Medical Adviser to the Controller for Development and Welfare in the West Indies. It extended from the 28th October to the 12th of November, 1943. This report should be read in conjunction with the report of my former visit.

PROGRAMME OF VISIT.

2. Several days were spent at the Leper Asylum at Spanish Town examining patients along with the Visiting Medical Attendant and Sisters, and advising regarding treatment. The children of a few schools were examined in Spanish Town and other places, and visits were paid to the parishes of Trelawny, St. Ann, St. Elizabeth, Manchester and Clarendon. A demonstration was given to 60 Sanitary Inspectors and Nurses and another to doctors, at the Leper Asylum.

Note—The first visit was made in August, 1942 and a Report was submitted to the Director of Medical Services and published in the January, 1943 number of the "Leprosy Review."

LEPER ASYLUM.

3. The principal development during the past 15 months since my last visit, is the erection of new quarters for male patients. These consist of three pairs of blocks, each half block consisting of thirteen small rooms, 8 feet by 10 feet in size, with a common verandah, latrines and bathrooms for each block. Each patient will have a separate room, a great improvement on the present crowded quarters. There is also a house to accommodate twelve boys, and a hospital with 24 beds and a treatment block with dispensary and store. An excellent entertainment hall has been erected between the male and female quarters, which will hold over 200 people, and a building for canteen with separate entrances to the male and female sides. There is an up-to-date kitchen with two warren cookers and a large open-sided building which can be used for a school reading room and recreation room. A wall has been erected between the male and female quarters, but the fence which surrounds most of the new compound is unfortunately not calculated to prevent patients who wish to leave the institution without permission. A room for dressing sores is still wanting, and raised paths are needed to make it possible to reach the various buildings when the ground is flooded, as occurs when there is a heavy shower of rain. When these are supplied it will be possible to transfer the male patients to the new compound.

4. Reconditioning of the previous men's quarters will make more room for the female patients and allow for separate quarters for early neural cases, especially children, who should be isolated from the more infectious cases. I understand that several of these are on a waiting list to be admitted as soon as the changes are completed.

5. The Medical Attendant has not yet been sent abroad for special study of leprosy, and I recommend that this be arranged as soon as possible. This should be easy to arrange as the Medical Attendant's work is now restricted to the Leper Asylum, the Jail and the Poor House.

6. Sister Marina spent three months of special study at Chacachacare and has found her period of study there of great value.

7. I should like once more to express my appreciation of the excellent work done by the Sisters. Not only are they nursing and caring for the sick, but they act as Superintendent, Steward, Clerk and fill all the offices usually performed by male officials in other similar institutions. This implies work by day and night, and they are often on duty for exceedingly long

periods. While up to now they have borne the strain of this work, I consider that it would be wise as well as just to arrange to increase their number from six to eight, which would make it possible for them to go on leave and otherwise lessen the weight of work.

8. I wish to emphasise again the importance of the five items enumerated in my last report.

i. The Medical Attendant hopes to use one of the rooms in the new hospital as an operation room, but there are practically no equipment and instruments to perform even the most elementary operations which would give the patients relief and raise the standard of treatment. I suggest that instruments should be ordered without further delay, and meantime a few instruments lent from other hospitals.

ii. A microscope and basic laboratory equipment should be supplied as soon as possible. Sister Marina has studied the ordinary simple clinical laboratory technique and under the Medical Attendant is able to make the ordinary routine examinations. The study of individual cases cannot be satisfactorily made unless the examinations can be made on the spot.

iii. The Sister has also studied dental work at Chacachacare and proper equipment is required to enable her to attend to the patients' teeth.

iv. The motor van suggested in the last report cannot at present be obtained, but it should be supplied when conditions make it possible.

v. Much has been done by the Sisters to develop occupations among the patients; furniture for the new buildings is being made out of odds and ends of material. Many of the patients are showing themselves willing workers and the health and discipline and morale of the institution are steadily improving. Every support should be given to this important side of the work.

CONTROL OF LEPROSY.

9. In my former Report I suggested the revision of the Leper Asylum Law. During this second visit I have been even more impressed with the need of urgent action, either to alter the Law, or make it possible to circumvent its most harmful clauses.

10. *Admission to the Leper Asylum*: There are at present three methods of admission according to the Leper Asylum Law.

(*a*). The patient may declare himself a pauper and be admitted as a voluntary (free) patient. Self-respecting patients who are able to support themselves outside, naturally object to declaring themselves paupers, though they cannot contribute to their maintenance if they leave their work and enter the institution. I consider that all open lepromatous cases should be admitted and also all neural cases in which the disease is beyond the first stage. When necessary a small allowance should be made to maintain the dependents, this being given at the discretion of the Medical Officer of Health assisted by the Sanitary Inspector or Nurse.

(*b*). If found begging, seeking precarious support or exposing himself in public places, the patient may be arrested and admitted to the Asylum. While this may be effective in towns like Kingston, it cannot be applied effectively in outlandish places where there is seldom a representative of the Law or Public Health Authorities to check upon the patient's behaviour. Perhaps it is because of this that leprosy tends to linger on in such out-of-the-way places. An outstanding instance was shown me by the Medical Officer (Health), St. Elizabeth. There are three lepers of the infectious type living in the same yard, along with two healthy children and four adults. They are known to mix with the surrounding inhabitants and are in an excellent position to spread the disease. As they refuse to co-operate, and as evidence is wanting which would enable them to be admitted under this Section, they continue to be a danger to the community. I understand that there are at present in Jamaica 17 lepromatous cases unsegregated, who are in contact with 47 children under the age of 15 years. In my opinion all these cases should be isolated without further delay.

(*c*). Lepers may be admitted voluntarily as paying patients on the same basis as patients who are admitted to ordinary hospitals, that is, they can leave again whenever they wish. Under such circumstances it is impossible for the Public Health Authorities to control their movements.

11. *Discharge from the Leper Asylum.* There are two principal ways in which this may be done.

(*a*). A patient, whether infectious or not, may be discharged by the Commissioner of Police on a surety of £20 that he will be properly maintained, treated in private and not suffered to be at large. Recently a patient was dis-

charged in this way without reference to or the knowledge of the Medical Department. A few days later he was found riding on public vehicles. No definite restrictions had been laid down or arrangements made for Public Health supervision.

The object of the Law should be for the safety of the citizens. When the present Leper Asylum Act was framed, leprosy was looked upon as a disability and the leper as one who made himself a nuisance by begging in public. Modern public health laws and the way in which leprosy is spread, especially in the patients' home, were at the time, not understood. In respect of leprosy legislation Jamaica is behind other British Colonies in the Caribbean area. I suggest that the Leper Asylum Law be abolished and a Leprosy Act, based upon that of Trinidad, be framed, or alternatively, that there be no separate law for leprosy, but that suitable clauses be included in the general Public Health Law.

(*b*). If a patient is considered by the Medical Attendant to be fit for discharge, he can forthwith discharge the patient and inform the Director of Medical Services, who reports the discharge to the Governor. There are several patients in the Leper Asylum at present in whom the disease is arrested and who are fit for discharge; but the difficulty is to get them absorbed once more into the community. The usual procedure is to send a note to the Medical Officer (Health) of the parish to which the patient belongs, asking certain questions which are answered after enquiry by the Sanitary Inspector. They are:—"Whether the relatives are willing and able to receive back and maintain the ex-patient, and whether there is suitable accommodation for him at the relatives' home." In special cases a single grant of £5 to facilitate rehabilitation might be made, allowing a sum of £50 per year for the purpose.

12. With regard to the question of accommodation, a most important matter is the type of leprosy from which the patient has recovered. If this has been the lepromatous type there is always the possibility of relapse under the less favourable circumstances of the patient's home, and the fear that if he were sharing the same room with others, he might spread the infection before the relapse could be recognised. In such a case special precautions should be taken regarding both accommodation and frequent examinations. The majority of ex-patients in Jamaica, however, have formerly suffered from the neural type, and the

danger of their relapsing into the open infectious type is very remote. In such cases there is no need for special isolation in the home.

13. The second difficulty of discharging patients with arrested disease, is to arrange for maintenance. When the patient cannot maintain himself, and the relatives are not able, or willing to do so, a small weekly allowance, averaging 5 shillings, might be given at the discretion of the Medical Officer (Health). Allowance might be made for 12 cases in 1943, rising to 24 in 1944. Thereafter the amount for maintanence could be reconsidered. Such a sum would make absorption into the community possible and would ensure that the ex-patient remained under the medical inspection of the Medical Officer (Health) and the Sanitary Inspector.

14. It is important that patients should be discharged as soon as practicable. I found several in the Leper Asylum who could have been rendered fit for discharge years ago by the use of intradermal injections of hydnocarpus oil. The present feeling is that patients are admitted for life. While this may be true for most lepromatous cases, it should not be true for neural cases. The popularity of the institution could be very much increased by the speedy recovery and discharge of a proportion of the patients.

15. I have suggested above making a small allowance when necessary in support of the dependents of lepers' families — especially in cases which the patient is the breadwinner and his forcible removal implies destitution—so as to ensure that all open cases are admitted without delay and that all closed cases have immediate treatment with a view to early discharge. A small allowance of 5 shillings per week could be made at the discretion of the Medical Officer (Health) in consultation with the Medical Attendant of the Leper Asylum, allowing for 15 cases per year beginning in 1944. The difference between leprosy and the other diseases in this respect is that in the former the patient is compulsorily incarcerated for a number of years, which is not so in the case of these other diseases. I have also suggested that a small allowance be given to discharged arrested cases when they are not otherwise able to maintain themselves, also that these monies be dispensed through the parochial health authorities. In my opinion this money would be well spent and should in the long run save the colony a considerable sum of money by hastening the control of leprosy and the time when a leprosy institution will no longer be necessary.

16. *Leave to Non-infectious Cases.* I consider that short leave to non-infectious cases might be considered. At Chacachacare, it is the custom to allow reputable non-infectious cases leave of 1 to 2 weeks on their furnishing a surety of from £2 to £10 which will be forfeited if they do not return at the right time. I consider that it is well that patients who are of the non-infectious type and who are likely to be ultimately discharged, should occasionally, when they desire it, be given an opportunity of visiting their homes and thereby keeping in touch with the outside world.

17. *Survey.* A considerable amount of examination of contacts with infectious cases has been carried out by the parochial health authorities since my last visit. The other method of procedure—the examination of school children—has not been followed to any great extent. In making such examinations it is important that the body be entirely stripped and examined in good light, otherwise early lesions are apt to be missed.

18. I am pleased to see that new statistical forms are being used and the records of all cases kept up-to-date.

19. I was impressed even more than on my last visit with the importance of having a specialist permanently in the Colony, a doctor who has made a special study of leprosy and who can be consulted in doubtful cases. There would then be fewer occasions of mistaken diagnosis. The rapid clearing up of early neural lesions by intradermal injections of hydnocarpus oil should popularise the treatment and lead patients to come forward earlier for treatment.

SUMMARY.

1. The various improvements carried out at the Leper Asylum are recorded and those still urgently required are noted.

2. Chief among the latter is an addition to the number of the Sister's staff. This I consider particularly urgent.

3. Changes are suggested in the present laws concerning leprosy and especially the admission and discharge of patients.

4. It is suggested that small allowances be given to deserving dependents of lepers in the Asylum and to discharged patients who cannot otherwise maintain themselves.

ACKNOWLEDGMENTS.

I wish to acknowledge the help and courtesy received from the Director of Medical Services and his staff during my visit to Jamaica.

ABSTRACT OF A FURTHER REPORT ON THE OJI RIVER, LEPROSY SETTLEMENT, NIGERIA.

T. D. F. MONEY.

This report on six years work from 1938 to 1943, on the work of the Oji River Leprosy Settlement in Nigeria, gives the following information in addition to that contained in Dr. Money's report for 1941 and 1942, recorded in *Leprosy Review*, Vol. XV, p. 15.

The Settlement was founded in 1936 by the Church Missionary Society in conjunction with the Nigerian Government and Native Administrations, to provide for the institutional care of 250 leprosy patients of the Onitsha Province, with an area of 5,000 square miles and a population of 1,107,745, giving the high density of 224 per square mile. It is an isolated agricultural area and the people are mainly peasant farmers of the Ibo tribe. Between October, 1935 and July, 1936, nearly 2,000 applications for admission were received and in 1938 arrangements were made to provide clinics for out-patient treatment in the areas around the central settlement, financed by the Church Missionary Society and other charitable bodies and the Native Administration. A doctor and a nurse were supplied by the C.M.S. and two Toc H lay workers through the B.E.L.R.A. Educated Africans were employed and trained as assistants. The people were leprosy conscious, but they were mostly illiterate and their confidence had to be gained. The object was to control leprosy in the province as a whole with a view to its eventual eradication by means of a central settlement, out-lying clinics to treat as many cases as possible and surveys and preventive service to determine the extent of the problem and to investigate as far as possible the isolation of the highly infective patients. Training some of the more intelligent of the patients to enable them to assist in the work has been made good use of. Schools for educating child patients have also been organised; a number of them have eventually been recruited to add to the native staff. They are also taught useful arts and crafts, such as carpentry and making soap, pottery, etc.

Disabled, but non-infective cases present a difficult problem, as treatment is no longer curative, but humane considerations necessitate a certain number of them being cared for in the central settlement for a time at least. The cost of the work is kept down

by making the resident patients responsible for their own food, clothing and personal necessities and the charge of a small admission fee. All able-bodied patients are also required to work without remuneration for twelve hours weekly, including collective farming. The patient staff receive a low wage. Children are either paid for in advance by their relatives, or from some charitable source, such as the B.E.L.R.A. Child Adoption Scheme, in the case of about 100 of them. They live in a special compound and food is issued to them. They may also become wards of guardians. Married patients are separated from healthy mates. Games and a library for literate patients are also provided.

Clinics. These were steadily increased between 1938 and 1941 and each visited weekly by a medical officer and his assistants, with from several hundred up to one thousand cases attending at each. In 1942 it was decided to operate the clinics with resident staffs working five days a week and visited weekly as before, by a medical officer to inspect and issue supplies. This plan allowed the clinics to be increased from six in 1941 and 1942 to eleven in 1943, records of the cases being kept and slides taken when necessary for bacteriological examination.

Surveys. It was not found possible to examine 100 per cent. of the population during local surveys, but the evidence indicates that few cases of active leprosy fail to attend the clinics for the sake of the free treatment provided in them. Many open lepromatous cases are thus brought to light and important information is gained regarding the incidence of the disease and the social conditions influencing its spread in the area dealt with.

Prevention. The way is thus paved for the introduction of preventive measures to reduce the contact between infectious cases and susceptible persons of their households, or near neighbours, especially healthy children. Propaganda is required to convince the population of the necessity for isolating in some way the more infectious cases by residence in the central settlement with the most efficient treatment, in villages established by the people in which only infectious cases reside, so that they cannot infect others, or by isolation when feasible in a separate room or house in or near the family compound. Leprosy villages have been established in the Ibo country, Ogoja, Owerri and Benin Provinces; only one has been founded in the Onitsha Province, but family isolation is a widespread custom in the latter area. Ex-patients have been employed to induce the infected patients to adopt isolation. By these various measures suspicion has been reduced and more willing co-operation of the people

in preventive measures has been obtained. Special Leprosy Control Officers are in charge of the Survey and Preventive measures in each area. Accurate diagnosis and classification of the cases is essential to success. Selective segregation of the infective lepromatous type of case is the only practical method on account of the large total number of cases. It is estimated that there are from 20,000 to 25,000 active cases of leprosy in the Onitsha Province, 15 to 20 per cent. of these, or a total of 3,000 to 5,000, are highly infectious ones which require to be segregated. The much larger number of neural are so little infective that their rigid segregation is unnecessary as well as impracticable; this reduces the problem to practical proportions. Thus, since 1939 it has been the practice to allow closed, little, if at all infective female cases to retain infants at the breast and none of the infants has contracted leprosy.

Research. Reference is made to work of Dharmendra and Lowe in Calcutta in improving greatly on the old Mitsuda or lepromin test, opportunities for clinical tests of which are great in Nigeria, although it has not yet been possible to make full use of them. Two series of cases illustrating the progress between 1938-43 and 1941-43 respectively, as regards their bacteriological condition are recorded.

	1938-43		1941-43	
	No.	Per cent.	No.	Per cent.
Negative to bacteria throughout ...	582	79.5	295	79.2
Positive to bacteria throughout ...	59	8.0	35	9.4
Becoming negative	55	7.5	34	9.2
Becoming positive	36	5.0	8	2.2
Total cases	732		372	

It is concluded that the great majority of the cases coming to the clinics do not become positive or open cases to the danger of the community, so negative or closed cases can safely be treated at clinics.

Extensive statistics are included in appendices. The more important data for 1940 to 1942 have already been given in our issue of January, 1944. Those for 1943 show increases of 202 in the patients resident in the central settlement to reach 1,187; in attendances at clinics of 100,711 to reach a total of 305,793; and of treatments given by 64,375 to reach 341,684. The work of the Oji River Settlement has thus steadily increased in spite of wartime difficulties.

[EDITOR].

THE NEW LUAPULA LEPROSY SETTLEME T, NORTHERN RHODESIA.

Abstract of a Report by WILLIAM DENSHAM
Toc H Leprosy Worker.

The Settlement now being financed by the Northern Rhodesia Government in the Luapula Valley District, is on a site at an altitude of 3,100 feet and is about 10 miles from the Belgian Congo border, and 40 miles south of Lake Mweru. The district is heavily timbered and interspersed with thick bush and high grass. One side of the settlement is formed by a fast flowing river and the climate is very cool in the dry season from May to October and is not enervating to Europeans. The writer was transferred from Southern Rhodesia in May, 1943, to organise the settlement and now reports on the first twelve months work there. A bridge had first to be built across the Mberishi River to connect the site with a road to the Mission Hospital, a short distance away. Building sites were next cleared, workmen engaged and materials transported to the sites before the rains commenced in November. Houses were then constructed for the Superintendent and Nursing Sister; the hospital, with dispensary, laboratory, examination room and offices were built, together with 13 African staff houses, four patients' houses and store rooms, which were only receiving their windows, doors, etc., at the time of reporting at the end of the rainy season.

The further building programme includes fifty two-roomed houses for patients, five more African staff houses, two wards, operating theatre and an ulcer dressing shed; arrangements for these have been made. The boundary firebreak 6½ miles long will enclose approximately 500 acres of the settlement.

"The proposed plan for the treatment of leprosy in the Luapula Valley, a densely populated district, some 100 miles long and 60 miles wide is, of course, not fully prepared. No adequate survey of the area has ever been carried out to ascertain the numbers with leprosy requiring treatment. The tentative plan, however, to which it is hoped Government will give its approval, is for a central Settlement to accommodate 500 patients with all the amenities and attractions usual in Settlements of this nature. There will be a Church provided by the London Missionary Society, who alone will have the right to conduct evangelistic work within the Settlement. Other denominations will be able

to send visiting preachers to administer to members of their own churches. It is hoped to make the Church the centre of the social life of the Settlement and to have, in addition, recreation halls and schools. Occupational therapy will play a large part in the activities of the Settement. Farm land of high quality for this district will be available to patients and they will receive a house, rations, clothes and treatment free.

"A scheme for out-patients' clinics at suitable distances from the Settlement has been discussed and with this end in view I took over the two or three patients attending at Mbereshi Mission Hospital and opened an out-patients' clinic there—permission being given by Dr. M. Morton of the Mission Hospital. The response has been good and already in eight months, more than 113 persons have been examined and the average monthly attendance for injections is 60. New patients average twelve per month. Much interest has been shown by the local Africans and their chiefs and headmen. New patients have come sometimes 40 miles to be registered (after examination) for treatment. Reports have come in that there are many sufferers who cannot come in weekly from their villages to the clinic, who are preparing to come as soon as accommodation is available. It is hoped to be able to admit 100 single patients before the end of the next rains in May, 1945.

"The staff of the hospital at its opening will consist of a Nursing Sister, financed by Government, but a member of the L.M.S. staff—myself as Toc H Leprosy Worker acting for this Government as Administration Officer in Charge. (The secretarial and financial administration will be undertaken jointly by the officer in charge and the missionary in charge of Mbereshi representing the London Missionary Society). The African staff will consist of one fully trained Government medical assistant and two learner orderlies (these are at present in training at Mbereshi Hospital). Possibly we shall be able to engage or train an African nurse, but so far no suitable girl can be found for this post.

"If the scheme for out-patients' clinics goes ahead, a separate travelling staff will be required, and I suggest for consideration that this should consist of another Toc H Belra worker previously attached to the Settlement for a short time, an African laboratory assistant and a clerk and two or three dressers. Their job will be to supervise existing clinics and to prepare for extension of the work by conducting medical surveys (where requests for help in leprosy control are sent in by Native Authorities). An ideal adjunct to these surveys would be a propaganda tour, but this

could be undertaken by the travelling staff at first. I consider that suitable patients from this Settlement could be trained (during their stay for treatment) in medical duties and would provide on their discharge a source from which clinic orderlies could be drawn.

"Further recommendations and suggestions are made in the Report on Leprosy in Northern Rhodesia, by the Medical Secretary of the British Empire Leprosy Relief Association, on page 23 of Vol. XI, No. 1 of the "Leprosy Review."

"I would like to take this opportunity of placing on record my thanks to all Government officials and others who so kindly assisted myself and my family en route to this district from the south. I received every help and assistance and continue to do so. My special thanks are due to the Hon. Director of Medical Services, Lusaka, and to the Provincial Medical Officer, Kasama. I am also indebted to the Hon. Director of Medical Services for permission to publish these notes."

REVIEWS.

Leprosy in India. Vol. XVI, No. 1, January, 1944.

Wallace Crawford reports the results of an inquiry through correspondence with medical missionaries regarding the incidence of leprosy in West China. He concluded that all tribes are equally affected irrespective of altitude or climate and he agrees with Maxwell that the disease is a rural one, for most of the cases seen in towns originated in the country.

D. N. Bose writes on the treatment of leprosy complicated by syphilis in the Asansol Mining Settlement, where 16 per cent. to 20 per cent. of the leprosy cases are complicated by that disease. Arsenical preparations are too expensive for use there and Avenyl (B.W. & Co.), was not effective, so he advises 3 per cent. suspensions in 4 per cent. creosoted hydnocarpus oil of bismuth salicylate, or bismuth oxysalicylate, mixed in a mortar and sterilised on an oil bath at 130° C. for half an hour. Doses of $\frac{1}{2}$ c.c., increased by $\frac{1}{2}$ c.c. at a time up to a maximum of 4 c.c., are injected intramuscularly. Twelve cases with positive

Khan tests are reported, in ten of these the reaction became negative and in the other two it was reduced in degree.

V. P. Alexander gives the following advice on the treatment of neural leprosy. The administration orally of 1 to 2 oz. daily of wheatgerm flour, or Bemax, and of 1 to 3 oz. of ground nuts. For pains he injects 1 to 2 c.c. of a 25 per cent. solution of magnesium sulphate solution into the nerve sheath, or 2 to 5 c.c. or more around a nerve. For neuritis due to leprous reactions he injects intravenously 60 grains of sodium bicarbonate dissolved in 500 c.c of sterile saline.

Leprosy in India. Vol. XVI, No. 2. April, 1944.

Dharmendra and I. Santra write on the use of iodised hydnocarpus oil in place of the creosoted oil, the antiseptic of which is now difficult to obtain in India. The former is prepared by mixing "a small amount" of powdered iodine with hydnocarpus oil and heating the mixture on an oil bath gradually to 120° C. and then to 140° C. for thirty minutes. The method is based on that of Cole in the Philippine Islands, who added 7½ grammes of iodine to fifteen litres of purified esters. It has been given in doses of 2 to 5, or even 10 c.c. by subcutaneous, intramuscular and intradermal injection without trouble.

Dharmendra reports a trial of Berny and Mauze's intradermal reaction in leprosy with alcoholic extracts of the urines of cases, but was unable to confirm their positive results.