

# LEPROSY REVIEW.

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## Contents.

	PAGE
Editorial .. .. .	137
A Journal in a Federated Capital .. .. .	139
Treatment of Leprosy by Means of Alepol Tabloids A. G. BADENOCH AND E. S. R. ALFRED	144
The Organisation of Anti-Leprosy Measures in Surinam P. H. J. LAMPE	147
Leprosy in the British Solomon Islands L. M. MAYBURY	157
Leprosy in Ukuguru District, Tanganyika C. A. WALLACE	159
Some Facts about Leprosy in the Katanga, Belgian Congo E. R. KELLERSBERGER	162
Grants for Leprosy Work .. .. .	164
Indian Section—	
Leprosy in Women : Some Clinical Observations ISABEL KERR	165
The Uses of Mercurochrome Soluble 220 in Leprosy E. MUIR and S. P. CHATTERJI	171
Literature .. .. .	179

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## Editorial.

THE article on the organisation of anti-leprosy measures in Surinam, by Dr. Lampe, reprinted from "Het Geneeskundig Tijdschrift voor Nederlandsch Indie," is one which should be carefully studied by all those who are concerned with the question of leprosy prophylaxis. Surinam is a comparatively small area and country where the indigenous population appears to be very amenable to discipline. Therefore, it is easier to put into being, an adequate system for the control of leprosy. We have stated more than once in this journal that the ideal system is one which segregates, either in an institution or in the home, the infective case, brings the non-infective case under adequate treatment and/or observation combined with the following up and periodic examination of contacts. This system seems to have been put into force extraordinarily efficiently in Dutch Guiana. In addition, stress is laid on the adequate supervision of children. A very fair index of the incidence and seriousness of the leprosy menace in any country is provided by a systematic investigation of all children of school age. In Surinam it is found that a fairly high percentage of children have signs of a leprotic infection. Unless such children are brought under supervision the chances of them passing into the more advanced and hopeless stages of the disease are considerable. We would recommend the dispensary school system to the consideration of authorities in countries where the adequate inspection of schools is a possibility, and where it is found that most of the children in the country concerned attend school. This system of the treatment of children going on *pari-passu* with their education is seen in European countries in connection with tuberculosis. A similar system modified to suit local conditions could be adopted with advantage in leprosy.

We felt that an article which appeared in the "Straits Budget" a few weeks back was of such general interest that it merited a wider circulation. This account gives a very good picture of the excellent work being done at Sungei Buloh. The statement that the Federal leprosy settlement outside Kuala Lumpur is one of the best in the world is not an exaggeration. The writer of this editorial has seen the organisation and experienced the cheerful atmosphere of the settlement. There repose on his desk two book-rests, a perpetual memory of the gratitude of the patients at this colony. These were given to him after a two days visit,

when an opportunity was afforded of seeing the work and of helping in the treatment of the patients.

In the present number the article on the combined treatment with Alepol tabloids and intradermal injections will be of interest to workers, and should others wish to carry out investigations along these lines we should be glad to help in any way possible.

The articles on Leprosy in the Belgian Congo and in the Solomon Islands give pictures of the situation in two entirely different parts of the earth. Little seems to be known of the incidence and extent of the disease in either territory. From information to hand the Belgian Congo appears to be an area of high endemicity, and our experience seems to indicate that leprosy in areas bordering the Congo is not only prevalent, but the type of the disease seems to be comparatively virulent. The close study of the disease in the Congo and neighbouring territories where leprosy appears to be spreading, should be of value in elucidating epidemiological factors still unknown.

Similarly the situation in the Southern Hemisphere is one which already has given us a valuable insight into modes of prevention. Any information amassed concerning the incidence and mode of spread of leprosy in the islands of the sea should add to our knowledge of this still partially understood scourge, and help in its ultimate eradication. For no matter how far the day appears to be still distant, let us ever remember that our ultimate goal is the elimination of leprosy from the Empire, and therefore be the contribution apparently small, yet we welcome data concerning the spread, incidence and types of the disease in every country, for it is only by extensive investigation and study that the whole problem can be rightly appreciated and each side of it correctly evaluated.

The Indian Section contains an article on Leprosy in Women. Owing to the paucity of qualified lady workers in leprosy this question has not been given adequate attention, and we commend this excellent article to the attention of workers and trust that Mrs. Kerr's interesting and instructive observations will be followed up, and will stimulate further research into this question.

The article on the Use of Mercurochrome Soluble 220 has been reprinted so that workers outside India might have an opportunity of confirming these observations, for if they are sustained a useful addition will be made to our therapeutic resources.

## A Journal in a Federal Capital.

(Reprinted from "*The Straits Budget*.")

THE other day at the central leprosy settlement of the Federated Malay States, there was a sight which was so gay and so brave and so sad that for one uncontrollable moment it tore at the heart-strings of those visitors from the outside world who were there.

It was the afternoon of the annual sports of the settlement. An open space was bright with bunting and marked out for races and games. The adult patients, some hundreds of them, surrounded the arena. A little group of spectators from Kuala Lumpur sat in an enclosure by themselves. The sky was overcast, with storm-clouds massing dangerously, and the Sungei Buloh valley, usually so sunny and peaceful, was seen in a sombre light. Everyone waited for the sports to begin.

Suddenly there sounded the beat of a drum and the cheery tootling of fifes. The crowd opened, and through the gap came a procession which Charles Dickens, who saw the human side of everything, would have loved to describe. First came the band. True, there were only four or five players and their music sounded distinctly thin, but they all played away for all they were worth and the drummer, a boy who belongs to a family known throughout Malaya, swung his drumsticks with a truly professional flourish. After the band came the children, a hundred of them, dressed in the neat khaki uniforms of Boy Scouts and Girl Guides, and stepping out proudly beneath the admiring gaze of their elders.

Child victims, girls and boys, into whose delicate bodies the dread disease had bitten—and sometimes leprosy gets a deeper hold of children than of adults and is correspondingly more difficult to cure. What a demonstration of the blind, senseless cruelty of Nature! Yet the children of Sungei Buloh are children still. Cut off from the outside world, they make the best of their own little world. One has thrilled to the sight of a disciplined regiment marching to the strains of its band, but it was a finer kind of gallantry which these little marchers and their makeshift band displayed.

The moment passed and the sports began. Other and more practical thoughts arose. The children looked healthy enough and ran races as vigorously as though they were competing in any school sports anywhere. Their isolation,

one remembered, was actually less than that of the youngsters playing happily about in the one and only street of Gua Musang in Ulu Kelantan. The days when the grim legend, "Abandon hope, all ye who enter here," might have been written over the gate of any leprosy settlement have gone for ever, thanks to the many individuals and agencies now concentrating on the conquest of leprosy.

Nevertheless, leprosy remains one of the worst diseases that can attack mankind, not so much because of its physical characteristics as because it involves segregation and separation from the rest of mankind.

To most people leprosy is still only a terrible name. How many people in Malaya have visited one of the three large settlements in this country? Yet such a visit involves no risk and it upsets like a house of cards Biblical and traditional notions of leprosy, creates a sane attitude towards the disease as a purely medical problem, and reveals the vast difference between mediæval and modern methods of treatment.

It is no longer necessary for the sufferer from leprosy to sever his social, occupational and cultural interests or to resign himself to an empty and inactive life. Not only has he real hopes of a cure, but he is encouraged to live and work as a citizen of a self-contained community and not as a patient in a hospital. The psychological difference is tremendous.

The Federal leprosy settlement is one of the best in the world. That sounds an exaggerated claim, considering the small size and population of the Federated Malay States, but many distinguished visitors, including the President of the International Leprosy Conference which met in Bangkok last year, have testified to its truth.

Finished about 18 months ago, and constructed at a cost of more than three quarters of a million dollars, it embodies the modern theory of the treatment of leprosy, which is to create an "isolation village" rather than a hospital and to assist the patients to live normal and happy lives in every possible way.

Nothing brings home to the visitor the up-to-date character of the settlement more than his first sight of it. After motoring 15 miles from Kuala Lumpur, through the mining lands of the Kepong district and the rubber estates beyond it, he reaches the little village of Sungei Buloh and follows a narrow road running through a valley taken up with Chinese market gardens.

At a turn of the road he stops and stares in astonishment. Whereas he has been expecting some grim, hospital-like building, he sees ahead of him, spread out on a gentle slope leading up to an overshadowing hill of virgin forest, a collection of white-walled and red-roofed houses that instantly brings to mind the garden suburbs of English towns. Here, indeed, is something startlingly different from the old leprosy wards of Singapore and Kuala Lumpur!

A short distance farther on the visitor reaches a gate-house and a wire fence. That fence is the only evidence in sight that compulsory segregation is the policy of the Federal Government for the treatment of leprosy. The fence is scarcely stronger than a farmer might put round his field, and certainly it would be easy for a patient to slip through it at night. But they very rarely do. Of a population of 1,000 only about 30 absconded last year. The patients themselves look upon the settlement as a haven of refuge.

The compulsory segregation does not necessarily mean segregation in a settlement. The health authorities of the Federated Malay States are permitted by law to allow a sufferer from leprosy to make his own arrangements for segregation, provided he can do so satisfactorily, but a number of middle-class persons to whom this permission has been given have eventually preferred to enter the settlement, where they can receive more specialised treatment and live useful and active lives as servants of the little commonwealth.

"A little commonwealth." That fact is impressed upon the visitor at every turn. Once he is within the boundary fence every person he meets except the two medical officers is a sufferer from leprosy. The steward and assistant steward, the clerk, the dispenser, and dressers, the laboratory and dental assistants, the schoolmaster, the internal police, the carpenter, the fitters, barbers, cooks, dhobies, gardeners and attendants of various kinds are all recruited from the patients and are Government employees drawing wages.

Thus, in a community of a thousand people, we have only two who are not suffering from leprosy. This being a deforming rather than a disabling disease its victims are usually able to work, and nothing is better calculated to keep up their morale than the opportunities which have been created in this way for regular and useful employment.

A stroll round the village teaches one a great deal about the ideas which the settlement embodies. There are more than 140 houses, and the streets are gay with flower gardens kept up by the inhabitants. These dwellings house two, four or six people. The smallest type are usually allotted to

married couples, of whom there are quite a number. No one who has not the disease is admitted to the settlement, whether husband, wife or child, but it not infrequently happens that marriages take place within the settlement.

Children born there are removed at birth to a special ward in Kuala Lumpur and have every prospect of growing up free from the disease which afflicts their parents. Other inhabitants have adopted children admitted to the settlement with happy results.

The larger dwellings are occupied by groups of friends or persons of the same race who elect to live together. Each dwelling has its own kitchen, where the food obtained from the central distribution centre is cooked. One cannot fail to notice the neatness and cleanliness with which these dwellings are kept up, and their homely appearance.

There is sufficient space for a small garden around each dwelling. Poultry are everywhere, the fowls and eggs being sold to the contractor who supplies foodstuffs to the settlement and re-sold by him to the superintendent, and many of the inhabitants keep rabbits, pigeons and guinea-pigs.

All this domestic life is not forced or artificial. As one strolls through the streets one feels unmistakably that one is in a village, an unusual kind of village admittedly, but still a centre of normal life and activity—and not a hospital!

Cats are sunning themselves on cottage doorsteps, women doing needlework within, fowls clucking to their chickens, people cooking or working or sleeping. Outside the houses is a fringe of gardens, some 12 acres, running up to the jungle, and in these gardens vegetables are grown by the inhabitants for sale but again only for consumption within the settlement. In one corner are the piggeries, where 250 pigs are a source of wealth to their owners.

One passes several shops and inquires what internal trade goes on in a community in which food and clothing are free. The answer is that, although tobacco is provided for the patients, the other luxuries and oddments which they require are bought at these shops, and a surprising amount of money circulates in the settlement, thanks to the system of employing its inhabitants to do its administrative and minor medical work.

The visitor is taken to the Green Club, which caters for the educated members of the community, and to the Chinese Club, and he is shown a copy of the settlement's quarterly journal, *The Dawn*, edited by Mr. S. Y. Yuen, and printed within the settlement. There is also a wireless

set and a cinema, and Malay, Chinese and Indian amateur dramatic entertainments are given frequently.

These activities are financed in part from the Lepers' Aid Fund, a fund maintained mainly by charitable Chinese residents of the Federated States. No better way of making a little money go a long way, and of creating happiness where it is most needed, can be found than through this fund.

The curative side of the settlement is hopeful. Knowledge of leprosy is not yet advanced enough to justify the use of the word "cure"; leprologists prefer to say "arrested"; but the practical result is the same, for a patient who can show a clean bill of health over a quarantine period of two years is discharged, free to enter the outside world and mix with his fellows again, subject only to periodic examinations.

Eighteen were discharged from the Sungei Buloh settlement last year, and their departure had a marked moral effect on those left behind. The old feeling of hopelessness was replaced by hope, and in future years it is hoped that the curative possibilities of the settlement will be impressed even more strongly upon the patients and the general public, for the number of patients now in the "quiescent" stage indicates that as many as 50 may be discharged annually in the future.

Of the methods of specific treatment it may be said that various theories and preparations are being tried, chaulmoogra oil in one form or another being the base of them all, but the main object of the treatment given, and of the whole organisation of the settlement, is to help the patient himself to combat the disease. Immediately he is admitted he is thoroughly examined, so as to eliminate all other diseases or ailments from which he may be suffering, and every effort is made to build up his general constitution.

One does not wish to hide the realities of the settlement, to paint in bright colours what is in truth a sombre scene lit up by gleams of sunlight and by breaks in an overcast sky. Pippa would not have sung "God's in His Heaven, all's right with the world," had she passed through Sungei Buloh.

"We make the best of a bad job," said one of the leading inhabitants, a man well qualified to figure in business or professional life, to the present writer. The settlement has a lovely setting. . . but it is 15 miles from men and towns. For a man accustomed to a full life, whose spirit has not been dulled by the endless toil and poverty of working-class existences it needs courage and philosophy to be an active





VIEW OF LEPROSY SETTLEMENT, SUNGEI BULOH, NEAR KUALA LUMPUR, FEDERATED MALAY STATES,  
Treatment Block is seen in the foreground.



" BETHESDA " LEPROSY ASYLUM. BRIDGE BETWEEN ASYLUM AND NURSES' QUARTERS.

and helpful citizen of this bright village nestling beneath the forest wall. Even to a visitor, who knows that he will shortly get into his car and speed away to Kuala Lumpur, a tour of the settlement is a saddening experience.

Although that is so, especially in the dormitory wards where old men and invalids unable to take care of themselves are placed, one sees happy sights as well. One is introduced to a bright-eyed boy in his teens, speaking excellent English, with the light of hope in his face. He has shown no symptoms for some time and will soon be discharged if all goes well. And there are other cases of a like nature.

If sufferers will only seek treatment as soon as the disease is discovered, before it has taken a strong grip of them, they have a real chance of recovery. And at the Sungei Buloh settlement they will be helped to fight their enemy with every possible weapon, physical, mental and moral. One can only conclude this article by saying that one has never seen the science of medicine in a more generous, humane and enlightened aspect than it presents in the new leprosy settlement of the Federated Malay States.

## **Treatment of Leprosy by Means of Alepol Tabloids.**

A. GUTHRIE BADENOCH & E. S. R. ALFRED.

**F**OLLOWING a suggestion made in a letter from Dr. R. G. Cochrane to Dr. A. Neave Kingsbury, three groups of cases were chosen, as follows :—

A. On alepol tabloids alone.

B. On these tabloids in conjunction with intradermal injections of iodised esters.

C. On intradermal injections of iodised esters alone.

The course was to last six months. It was suggested that 20 to 50 cases should be selected for the experiment. Knowing how difficult it is to persuade Sungei Buloh patients to continue a course of treatment, we began with 20 cases in Group A and 16 in Group B. All these were, perforce, of C1 N1 type. Previous experience of intradermal treatment had not been good, so we had to wait some weeks before we were able to form Group C, and bring B up to strength.

Burroughs Wellcome and Co. were asked for a further supply of tabloids and sent 1 × 500 on October 16th, 1931, and 2 × 500 on October 31st, 1931.

*The Experiment.*

The course lasted 17 weeks, including two weeks' rest from oral treatment (ninth and tenth weeks).

The dosage of Alepol tabloids was as follows :—

First week—One tabloid on Wednesday and one on Saturday (at 8 a.m.).

Second week—Two tabloids on Wednesday and Saturday (at 8 a.m. and 3 p.m.).

Third week onwards—Three tabloids on Wednesday and Saturday (2 at 8 a.m.) and one at 3 p.m.).

The morning dose was given on an empty stomach, the afternoon dose just before the evening meal.

The course was started without making use of sod. bicarb. as suggested. During the first week there were many complaints of nausea, and a draught of glucose and sod. bicarb. solution was then given with the dose. In spite of this a total of about ten dropped out at varying stages in the course, giving nausea and even vomiting as their reason for wishing to stop.

The intradermal injections (Groups B and C) were given weekly (every Wednesday) in doses up to 5 c.c. as a rule, one case receiving 10 c.c. at one dose.

The signs and symptoms of improvement (or the reverse) were taken to be :—

1. Subsidence, or disappearance of patches (extension of patches, appearance of new patches).

2. Decrease of numbness or nerve pain (increase or onset of ditto).

3. Decrease of stiffness and contractures (increase or onset of ditto).

4. Improvement in general health (deterioration of ditto).

The following table shows the results in the cases that completed the course. The observation was made one month after cessation of treatment.

	<i>Group A.</i>		<i>Group B.</i>		<i>Group C.</i>	
	<i>Cases.</i>	<i>Per cent.</i>	<i>Cases.</i>	<i>Per cent.</i>	<i>Cases.</i>	<i>Per cent.</i>
Moderately improved ..	1	7	5	25	1	10
Slightly improved ..	7	47	10	50	9	90
No change .. ..	3	20	2	10	0	—
Worse .. ..	4	27	3	15	0	—
Total No. treated ..	15	—	20	—	10	—

*Notes.*

1. The 15 cases in Group A had received tabloids thus :  
 $13 \times 15$  weeks.  
 $1 \times 14$  weeks.  
 $1 \times 13$  weeks.
2. The 20 cases in Group B had treatment thus :—
  - (1) Tabloids :—  
 $15 \times 15$  weeks.  
 $5 \times 10$ —14 weeks.
  - (2) Injections :—  
 $12 \times 10$ —13 injections.  
 $8 \times 3$ —9 injections.
3. The 10 cases in Group C had 6—10 injections each.
4. Five cases of Group C were of type C2 and C3, the neural involvement varying. As stated, the remaining cases in the experiment were C1 N1.

*Conclusions.*

Group A.—1. Alepol tabloids were usually well borne and well received by patients.

2. The impression gained was that *selected* cases might be given a much larger dose of Alepol tabloids. In view of the high proportion of worse cases, this treatment should not be pressed on the unwilling. Symptoms are probably a safer guide than signs in this connection.

Group B—3. Alepol tabloids with intradermal esters appears to be a very useful treatment combination. The impression gained was that the *local and general* results were better here than in the other two groups, though the proportion of advanced cases in C Group must qualify this. Examination (in the course of the day's work) subsequent to the experiment has strengthened the claims of "Group B." It will be very interesting to know what other experimenters have found here—many of whom may have been able to match their cases more accurately and to continue the course for 6/12 months without failing in regularity.

Group C—4. In all cases the injected patches improved markedly (bearing out the conclusions of most workers elsewhere).

All Groups—5. We consider Alepol tabloids deserve a more extensive trial.

## The Organisation of Anti-Leprosy Measures in Surinam.

P. H. J. LAMPE.

(Reprinted from  
*Het Geneeskundig Tijdschrift voor Nederlandsch Indie*).

### PROVISIONS OF THE LAW.

**E**VEN as early as 1728, it was forbidden for cases of leprosy to make their appearance in public, and since 1763, infected slaves have been segregated on the estates (Fermin).

The first ordinance was dated from 1790, and an asylum was erected for infected slaves (at that time a few Europeans were infected on the estates).

After the measures were enacted under which only slaves could be forced into segregation, further measures were taken in the ordinances of 1830, 1845 and of 1855, ordaining that the police could bring before a commission all suspected cases seen on public roads. If those persons were declared to be infected, segregation was ordered in an asylum. Sufferers who voluntarily submitted themselves to an examination could not be forced into segregation, unless they appeared on public roads.

On January 1st, 1930, the Royal Warrant of September, 1929, No. 32 (known as Leprosy-Ordinance, 1929), came into force, cancelling the leprosy-ordinances of 1830, 1845 and 1855.

### THE LEPROSY-ORDINANCE, 1929.

The leprosy-ordinance of 1929 has altered the regulation of compulsory segregation, which was to be considered as a punishment. Instead of this, medical treatment of non-segregated patients is placed in the foreground, whereby they have to obey the precautionary measures which are stipulated by the medical authorities with a view to preventing infection. In the event of these stipulations not being carried out or fully complied with, or in case the domestic conditions, considered in connection with the nature and state of the disease, are such that the most necessary stipulations cannot be complied with segregation is ordered at once. The stay in the asylum, where all attention is given to the medical treatment, does not last any longer than is deemed necessary or desirable for medical reasons. The asylum thus gets the character of an institute for treatment, from whence

the patients can be discharged, when in accordance with the generally accepted views the treatment can be continued at home. The discharge is carefully prepared, in particular with regard to the contemplated place of residence.

#### THE ORGANISATION OF ANTI-LEPROSY MEASURES, BASED ON THE LEPROSY-ORDINANCE OF 1929.

This organisation is looking after :—

- I. The tracing of cases of leprosy.
- II. The treatment of patients, not segregated in asylums.
- III. The control regarding obedience to the provisions stipulated by the medical authorities ; and
- IV. The segregation of patients in asylums and their treatment there.

##### *I.—The Tracing of Cases of Leprosy.*

Nobody is considered to be suffering from leprosy unless he is certified by a board of medical men, appointed by the Governor for that purpose (Article 5, Leprosy-Ordinance). The board, known as "Leprosy Medical Board," consists of five members ; the Surgeon-General is officially a member and chairman. The board is assisted by a physician appointed by the Governor.

##### *(a) Examination of School Children.*

In the City of Paramaribo, the schools are visited by the above physician. He carefully examines the teachers and pupils at least once in every four years, and as often as will be deemed desirable by the Surgeon-General, on the understanding that newly-appointed teachers have to be examined before their admission to the school, and newly-registered pupils during the first half-year of their attending the school. The teachers and children who object to submitting to this examination are not allowed to continue attending the school. The Surgeon-General is authorised to appoint another physician for this examination in case such is requested.

In the districts, the district medical officers have the same authority and obligations. As a rule, the schools in the districts are visited four times a year by the district medical officers.

This examination of school children has proved to be the most efficient way of finding out slight or early cases of leprosy. In the beginning—in accordance with a stipulation in the Education-ordinance—children were not permitted to attend the schools unless they could show a testimonial from a private physician (often the family

doctor) declaring that the children were not suffering from any infectious disease.

In 1927-1928, all school children were thoroughly examined for leprosy by specially-appointed physicians in anticipation of the new leprosy-ordinance. In Paramaribo, where about 8,800 children were examined, the result showed that of the school children who were brought before the Leprosy Medical Board as being suspected cases, 123 were declared infected, and 44 so highly suspicious that they were forbidden to attend the schools; clearly a proof that the above-mentioned examination must be done by physicians specially appointed for that purpose. This is guaranteed for the future by the Leprosy-ordinance of 1929.

(b) *Examination of Relations or Contacts: Voluntary Announcement.*

Besides the means of regular school examinations, some suspected cases are traced by medical examination of relations or contacts of newly-detected leprosy-patients, and by medical examination of those who voluntarily appear before the Board (especially young adults) or of persons brought before the Board by others (servants, nurses, laundresses, etc.). Some cases are also detected in hospitals or dispensaries (for skin diseases).

(c) *Compulsory Announcement.*

It may be added that every medical man in Surinam is in duty bound to communicate with the Board as soon as he discovers leprosy in any person or signs which give rise to suspicion of that disease.

II.—*The Treatment of Non-Segregated Patients.*

The leprosy-ordinance does not provide for any compulsory treatment. Yet in Surinam people have not refused treatment.

1.—*The Treatment in the City of Paramaribo.*

In the City of Paramaribo, a special service takes care of the regular treatment of all non-segregated patients. The chief of this service is assisted by two nurses (routine matters, attending of wounds, house visits). All laboratory examinations are done in the leprosy-laboratory, under supervision of a bacteriologist.

In accordance with the decision of the Leprosy Medical Board, patients are attended either at home or at an outdoor dispensary.



As a general rule patients who can be recognised as such by any one at first sight and bacteriologically positive cases, are visited and attended at home, whilst all other patients are allowed to visit the dispensary twice a week or as often as is deemed necessary by the physician charged with their treatment. They must not, however, be seen in public for other purposes.

(a) *The Treatment at Home.*

The number of patients attended at home in Paramaribo amounts to 45 (October, 1931). This number was larger in the past. The decline is the result of the increase of the number of bacteriologically positive cases as a consequence of a better laboratory technique and the evacuation on a still larger scale of positive cases, the latter in consequence of a more serious view taken by the Leprosy Medical Board and a more severe insistence on obedience to the provisions stipulated.

(b) *The Dispensary for Leprosy-Patients.*

The dispensary is situated in the grounds of the leprosy laboratory and the meeting room of the Leprosy Medical Board. The number of patients being attended clinically was 249 at the end of October, 1931.

The great difficulty in this dispensary, as with every long-lasting mass-treatment, is that with the duration of the treatment, an increasing number of absentees is noticeable. The attendance is about 85 per cent. Only by severe control and by means of punishment (annulment of favourable stipulations) can the attendance be kept to this standard.

(c) *The Dispensary School.*

Close to the dispensary for leprosy patients, an open-air school has been built (the type of school with cement floor, wainscot and roof on poles) for infected or suspected school children, who owing to repeated negative results of bacteriological examinations of all kinds, may be attended clinically. It is a Government public school where religious teaching is given to co-religionists by the different Missions. This school for children suffering from leprosy—known under the name of dispensary school—most obviously demonstrates the modern view on leprosy combatment. The school, inaugurated and taken into use on January 19th, 1931, is supplying a much-needed want.

After the mass removal of child victims from the public schools, it was too often proved that that measure alone was not sufficient. Whilst the healthy brothers and sisters

attended the school, the sick children were occupied with the nursing of young children and babies, assisting in the household (laundry work) and going into shops for food-stuffs and into the market ; uncontrolled children were always on the streets ; many of them did not even sleep at home. Besides, in consequence of their not being allowed to attend the schools many of those children who probably in the future might be able to earn a living, remained without any elementary education. A great advantage of the dispensary school is that treatment can take place there more regularly and in quieter and easier circumstances. The children are now going, under the supervision of the teacher of the class, to the dispensary for treatment. Further, more attention can be paid to the neatness of their garments and the cleanliness of their bodies, whilst the dispensary school also gives an opportunity to call the children's attention to the hygienic stipulations, which must be regarded of high value in connection with their illness.

The number of children attending the dispensary school is varying. There are children admitted (newly traced cases which became negative) and there are children falling off who are no longer suspected, and who are going to the ordinary schools, cases which became positive are staying at home or are evacuated. At the end of October, 1931, the number of children registered was 167. During the year 1931, up to the end of October, 185 children were registered at the dispensary school. During the same period, 18 children left the school, viz., four owing to their being allowed to attend the ordinary school again, eleven owing to positive results of the bacteriological examination (all of them being removed to an asylum) and three owing to bad conduct (house arrest). The number of school absentees is less than that of any public school in Paramaribo.

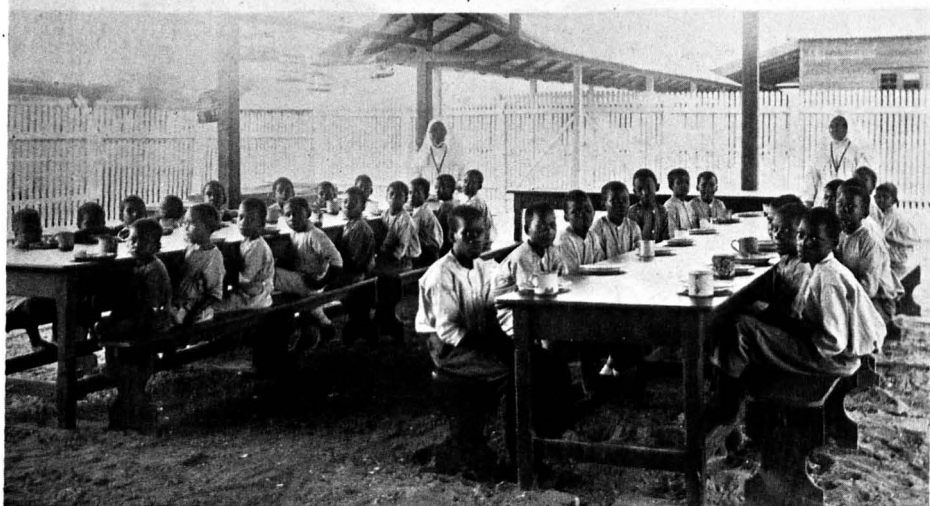
The number of teachers is four. These teachers are receiving a bonus besides their salary. They have a dressing and disinfecting room in the dispensary school.

#### *(d) The Playground of the Dispensary School.*

An extensive playground, situated around the dispensary school, was taken into use on August 18th, 1931. The ground is enriched with swings, seesaws, rings, climbing ropes, springboards, goals, baskets for basket-ball, etc. The idea is to pay close attention to well-taught body exercises, gymnastics, marching, mass-games, etc. A great therapeutic effect is expected from well-taught body exercises.



1



2



3

1. CHILDREN'S BUILDING.
2. BOYS' QUARTERS.
3. BEDROOM.



1



2

1. 'BETHESDA' LEPROSY ASYLUM. KITCHEN.  
2. "ST. GERARDUS MAJELLA" LEPROSY ASYLUM. KITCHEN.

(e) *The Surinam Leprosy Relief Association.*

The Surinam Leprosy Relief Association is a private association which has set itself the task of combating the endemic disease of leprosy in Surinam. On June 29th, 1931, the Governor sanctioned the regulations. Large donations, the proceeds of a film-performance and a lecture on "Leprosy," contributions, etc., made it possible this year to start supplying food to the children visiting the dispensary school.

This supplying of food free of cost to school children is not to be considered as a social measure only. It is hoped that by means of good nourishment, improvement of general health conditions and of the resistance of the patients, the symptoms which have manifested themselves will subside.

Other important advantages of the food supply are the decrease of school absentees and the possibility of keeping the children under control and care much longer. On the one side more attention can then be paid to well-taught body exercises and to the care of the skin (regular bathing, treatment of the skin with ointment of chaulmoogra oil and chaulmoogra soap). On the other hand the children are remaining longer off the streets and yards and longer from their home circle. The idea is to keep the children so long under care (lunch at school), that on their arrival at home, the younger ones especially, are so weary that they go to bed directly.

2.—*The Treatment in the Districts.*

In the districts leprosy patients are attended by the district medical officers. These physicians are also looking after the obedience to the obligations imposed on the patients by the Leprosy Medical Board.

III.—CONTROL ON OBEDIENCE TO THE PROVISIONS  
STIPULATED BY THE LEPROSY MEDICAL BOARD.

The principle of the Leprosy-ordinance of 1929 is, that a chance must be given to every patient to prove himself willing to obey the necessary provisions, stipulated by the Leprosy Medical Board; in the case of these provisions being obeyed, no segregation in an asylum is ordered. Only if it is clear that the most elementary provisions cannot be obeyed, and if cases are regarded as highly infectious, is removal to an asylum ordered at once.

The provisions stipulated for each case in particular are indicated to the patients or to the parents or to representatives by word of mouth and by letter.

Some of the most frequent stipulations which must be obeyed are :—

(a) In bacteriologically positive cases :—

1. Segregation in an isolated house, to be approved of by the Leprosy Medical Board ; as a rule, one or two adults are allowed to join the patient as supporters.

2. Prohibition to carry on a trade (seamstresses, embroiderers, laundresses, tailors, manufacturers of sweets, etc.).

3. Removal of the children on the illness of a grown-up or removal of the healthy children in case of illness of a child.

4. Prohibition to receive visits, or visits of children.

5. The hedging of the yard, in case it is in open contact with other yards.

(b) In bacteriologically negative cases :—

1. Prohibition to appear in public, except for the visits to the dispensary.

2. Prohibition to visit public places (clubs, dances, theatres).

3. Prohibition to carry on a trade.

4. Removal of young children.

(c) Less severe provisions are stipulated for the so-called "late neural types"; they are allowed to appear in public freely, remaining under control of the service.

The physician, charged with the treatment of non-segregated patients and the nurses charged with house visits see that the provisions are obeyed. In the districts, the district medical officers have control. The control is facilitated by a certain amount of supervision on the part of the population itself. They have a better realisation that obedience to the regulations on the part of non-segregated patients decreases the danger of infection. The practice has proved that the provisions are being obeyed fairly well not because of conviction but because of fear. Owing to negligence, 26 patients were removed to an asylum in 1930, and 19 patients up to the end of October, 1931.

#### IV.—SEGREGATION OF PATIENTS SUFFERING FROM LEPROSY IN ASYLUMS AND THEIR TREATMENT.

Physicians are under supervision of the Surgeon-General on account of the Government superintending the treatment of all sufferers from leprosy, all doubtful cases and all

asylums for their treatment (Article 1, Leprosy-Ordinance). The newly-appointed leprologist is charged with the supervision of the asylums.

A change in the nature or type of the segregated cases of leprosy makes a more "medical" character of the supervision in the asylums more desirable and useful now than ever before.

Formerly, in the time of the compulsory segregation of sufferers who were seen on public roads, the greater part of those segregated cases consisted generally of aged invalids and social impossibles, on the one hand those cast out from their own circle (especially men who could not make themselves useful any longer); on the other hand, victims of the more serious attention of the police, more often arrested on account of animosity. Many of them—to be classified as "late neural types"—do not belong to an asylum for medical reasons.

Besides that category of patients, more often segregated because of social reasons, a new element made its entry in later years, viz., the cases to be regarded as highly infectious, especially young sufferers and children, often not to be recognised as cases of leprosy without a thorough medical examination.

In consequence of the new ordinance, the number of isolated patients has not remained constant or decreased; on the contrary, the population of the asylums has highly increased since the activities, based on the new leprosy ordinances (see statement below).

<i>Year.</i>			<i>Gr. Chatl.</i>	<i>Ger. Majella.</i>	<i>Bethesda.</i>	<i>Total.</i>
Dec.,	1920	..	145	123	56	324
"	1921	..	135	123	55	313
"	1922	..	136	131	57	324
"	1923	..	144	119	61	324
"	1924	..	151	117	61	329
"	1925	..	154	110	57	321
"	1926	..	167	139	49	355
"	1927	..	161	157	52	370
"	1928	..	166	176	66	408
"	1929	..	165	168	74	407
"	1930	..	158*	194	87	439*
July,	1931	..	158	207	88	453
Aug.,	1931	..	153	210	90	553
Sept.,	1931	..	157	216	91	464
Oct.,	1931	..	177	215	90	482

Add 30 Javanese cases who were evacuated to their native country at the end of 1930.

To make it clearer, it may be stated that the population of Surinam amounts to 134,000 souls, of which 47,000 are in the City of Paramaribo. For information about the appearance of leprosy in Surinam, *i.e.*, in the various races and ages, see the article "Lepra in Suriname" (Leprosy in Surinam), *Ned. Tijdschrift voor Geneeskunde*, 1929, II, No. 43, pp. 4903-4915 (*Tropical Diseases Bulletin*, 1930, August, Vol. 27, No. 8, pp. 672).

The increase in the number of children segregated in asylums is remarkable for the period 1928-1931. Both of the two private asylums are now in possession of separate wards for children; Bethesda since September, 1926; St. Gerardus Majella, since August, 1931.

### *Expenditure of the Service.*

The expenditure of the service so far as a charge upon the Colonial estimates, amounts to about F240,000 per annum, that is, F1·80 per head of the population.

SURVEY OF THE DECISIONS OF THE LEPROSY MEDICAL BOARD.  
(Based on the Leprosy-Ordinance, 1929.)

<i>Leprosy Medical Board.</i>	1930.		<i>Jan. to Oct., 1931.</i>	
	<i>Children.</i>	<i>Grown-ups.</i>	<i>Children.</i>	<i>Grown-ups.</i>
Declared infected .. ..	72	153	42	108
Declared suspected .. ..	77	33	24	13
Under supervision .. ..	113	49	84	30
No leprosy .. ..	33	18	34	6
Evacuated to an asylum ..	37	83	26	59
Compulsory removal to isolated homes .. ..	—	—	3	9
Prohibited to carry on a trade .. ..	—	—	—	7
Clearing of yard-houses ..	—	—	—	6
Removal of children .. ..	—	—	—	8
Prohibited to attend the ordinary schools .. ..	49	—	35	—
Allowed again to attend the ordinary schools .. ..	12	—	4	—
Admitted into society with further treatment .. ..	12	17	4	2
Discharged from an asylum	2	—	—	3

*N.B.*—Many patients appear several times before the Board in the course of a year. The sittings of the Board are arranged by the physician charged with the treatment of non-segregated patients (*historia morbi*) and by the leprologist (bacteriological examinations).



## SURVEY OF THE NUMBER OF PATIENTS UNDER TREATMENT AND SUPERVISION OF THE SERVICE.

<i>Cases Known.</i>	<i>Dec., 1927.</i>	<i>Dec., 1928.</i>	<i>Dec., 1929.</i>	<i>Dec., 1930.</i>	<i>Oct., 1931.</i>
<i>Treatment—</i>					
Private .. ..	50 ?	35 ?	21	22	10
Government ..	15	444	513	557	444
Of these—					
No. at the dispensary in the city ..	4	244	327	350	249
No. at home in the city .. ..	11	87	85	80	45
No. in other districts .. ..	?	113	101	127	151
<i>Segregated</i> .. ..	370	408	407	439	482
<i>Not treated</i> .. ..	?	?	50	54	171
<b>Total</b> .. ..	435	807	991	1,072	1,107
Others under supervision .. ..	—	—	317	419	200

*Summary.*

The standpoint of the First and Second International Leprosy Conference that "compulsory segregation in asylums is the only means to combat leprosy," is nowadays practically forsaken. Even in those countries where the cases of leprosy are cast out, only segregation of those in a very advanced state can be attained, with which the combatting of the disease is little relieved.

"Any drastic measures leading to extensive hiding of early cases, are likely to do more harm than good" (Sir Leonard Rogers). This also concerns, unless there are very particular circumstances, the compulsory segregation for medical reasons, nowadays put into practice in Surinam.

The following circumstances are, however, met with in Surinam, viz. :—

1. Surinam has a small area and a small number of inhabitants.

2. The population is registered (compulsory notification of births, deaths, removals).

3. The children are obliged to attend a school (compulsory attendance).

4. The new ordinance—on which the compulsory segregation for medical reasons is based—has been prepared by means of an intensive leprosy-campaign (propaganda, tracing of cases of leprosy) whereby not one disagreeable measure was used.

Under present conditions, it seems to me that the above mentioned mode of combating leprosy is the most efficient

for Surinam and the most promising for the future, provided that the leader of the service never forgets that the tracing of early cases must be the main object of the organisation ; that segregation in an asylum must not be ordered unless absolutely necessary and in accordance with a defined indication, and also that in the eye of the population, the asylums must have the character of institutions for treatment where the " patients " are not kept longer than is strictly necessary.

## **Leprosy in the British Solomon Islands.**

L. M. MAYBURY.

**U**NTIL recently, not much notice was taken of leprosy in these islands, and even now, much is mere guess-work, as the number of cases can only be roughly estimated ; what seems fairly certain is that the disease is on the increase, judging by the number of children and young folk who are affected.

It may be said that the four hospitals in the group and a Government Travelling Medical Officer carry out the medical work, and at three of these treatment is being given to any cases who come for treatment ; in each case, the work is just a branch of general hospital work. At Fauabu, a part of the Mission land has been set apart for use as a leprosy village, and it is to be run as much like an ordinary village as possible ; for the moment, only males can be taken in, but shortly a house will be built for women.

In 1929, there were 42 cases of the disease in the Protectorate diagnosed by medical officers, and this represents only a portion of those infected.

In our colony at Qaibaita, there are at the moment 18 men and children, and this is our limit till more houses are built ; two women have just said that they are willing to come in, and more women will follow the lead taken by these two. With the grant that the British Empire Leprosy Relief Association has given us, a small dispensary will be built, and a small ward for nursing sick cases, as this is so difficult to do in the ordinary native house. Both the buildings will be partly European and partly native.

The whole problem of all the work, and it applies especially to leprosy treatment, is one of transport ; this is done by water or by road, and only round the coast is there anything more than a bush track ; this practically rules out much out-patient work, even if the lack of staff

did not do this. We shall have to win the confidence of the people gradually, but the length of treatment is a great stumbling block, as they have got used to the ordinary "needle" and expect results as quickly; their general nature, too, is not one that persists at anything, and they will be lazy if they get the chance. White supervision is needed the whole time, but the staff will not allow of this at present.

The people are only now beginning to isolate cases outside the village, and this chiefly amongst Mission converts. It is an introduced disease, and ignorance and their habits of betel chewing and excessive smoking and interchange of pipes and drinking vessels, makes matters still harder. Those who do realise its gravity often get exaggerated ideas of its infectivity, like the white layman in the islands. The people are averse to discipline, and a very strict segregation would only drive many away at present.

I have seen a few nodular cases, but some are badly mutilated, and are of the advanced nerve type. Since the beginning of the year, more are coming forward for treatment; our numbers are very small compared with other countries, but the population is comparatively small—150,000 in all the islands—as far as can be reckoned.

Alepol and moogrol are being used with trichloroacetic acid, which to the Melanesian, like the African, is very popular. Various local remedies for the ulcers have been tried, but iodoform in eucalyptus oil is now being used, but it is too early to report results yet.

The work here is at present a sideline from the main hospital, and developed on its own. I feel, however, that when the staff allows and we can travel about in the bush more, more cases will be brought to light. They know that there is no compulsion, and Christians of two denominations and heathen have settled down together. Three different islands are represented; no case is refused admittance to the village, although if he is a hopeless case, the truth is pointed out to him before he comes.

This station has only been in existence for two years and the village for only one year, yet I feel very encouraged.

It may, therefore, be said that the ideal for these islands is voluntary segregation at as many centres as possible, ideally, one on each island, with out-patient facilities for those that live close enough. Travelling in the bush and working with itinerating missionaries would bring us more in contact with sufferers from this disease and lead to a gradual gathering in of the cases.

## Leprosy in Ukuguru District, Tanganyika

C. A. WALLACE.

**L**EPROSY has been endemic in this district for many years, and the general concensus of opinion is that it is rapidly increasing.

The people here live on the border line of starvation. In a good year, they have a sufficient quantity to live on but suffer from the quality of the food which consists mainly of husked and ground Indian corn and millet. They use very little fat and vegetables, and get practically no proteins in their diet. In a bad year, they suffer in addition from lack of quantity. In many parts water is scarce or only obtainable from long distances thus making hygiene a difficult matter. No cattle can live in these areas on account of the glossina (tsetse fly), so milk and butter are only obtained at prices beyond the means of the African. The result of all this is that the ordinary person is undernourished and presents an ideal habitat for any disease that may be prevalent. Chronic malaria, syphilis, gastro-intestinal diseases and internal parasites (especially hookworm) are universal. So here we have everything favourable to the spread of leprosy—poor physique, a bad diet, debilitating diseases, bad hygiene and overcrowding. Above all, there is free and unrestricted movement of highly-infected cases of leprosy. They live and eat with their families who have no fear of them.

The official figure for Tanganyika (2·8 per mille) is greatly exceeded in this district. Judging by the number of cases whose gross lesions are obvious at a glance, I would say that there are at least 25 per mille. Closer clinical and, of course, microscopical examination, would reveal an even worse state of affairs.

Nodular and skin cases (papillary interfollicular and subfollicular, but especially the first), predominate. Nerve cases seem to be comparatively rare. The cases under treatment may be classified :—

N <sub>1</sub>	...	...	...	...	13	per cent.
C <sub>1</sub>	...	...	...	...	20	„
C <sub>2</sub>	...	...	...	...	22	„
C <sub>3</sub>	...	...	...	...	45	„

Chiefly on account of ignorance, treatment is not sought early and so the course of treatment is of necessity

rather prolonged. As ours are the only treatment centres in the district, patients have to travel long distances for injections. They dare not delay over their return home, because it is only by exercising great diligence in their field work during six months that the year's food supply (scanty as it is) may be assured, so treatment for concurrent diseases has to be neglected.

The remedy for this state of affairs lies in :—

(a) Propaganda—the fear of the disease must be instilled into the people by lectures and cinema films. The people in many parts know nothing about the disease, its cause and treatment or about treatment centres. Some of my patients still firmly believe that witchcraft is the sole cause of their troubles. They see no reason why they should not use the utensils and clothing of healthy people or foul their wells. A mobile cinema and lectures would enlighten them, and by going to the root of the trouble, lessen the work of treatment.

(b) The provision of more camps for those who would stay in them would enable better treatment to be given in a shorter time under skilled supervision. If these patients are tidied over the infectious stages of their disease in isolation there would be a great fall in the number of new cases. Treatment would be continuous and helpful advice and sympathy given. Their outlook would be more encouraging and their response to treatment would be better.

(c) There are many who will not, or cannot come into a camp or who are non-infectious, and their cases must be met by treatment centres. Out-patient treatment is not an ideal one for leprosy, but something must be done for these cases. Such centres would serve not only for injections, but they would be centres for leprosy propaganda. Foolish ideas could be combated and fears quietened.

During the year there has been a large increase in the number of new cases, but there has also been a decrease of the old ones. Patients stay away from treatment for the following reasons :—

1. Economic—they cannot spare the time as they have field and other work to perform.

2. The distance from their homes to the centres is so great that it is a tiring job going for injections.

3. Slight improvement in symptoms give them the impression that they are as good as cured.

4. Pain—we use hydnocreol and the injection of the

necessary bulk causes pain or, at least, considerable discomfort.

#### 5. Laziness and indifference.

It is our duty to combat these excuses, even though to us they seem trivial compared to the disease. We should provide more :—

(a) Treatment camps where infectious cases can be treated under supervision.

(b) Treatment centres for those who can't, won't or needn't enter the camps.

With those ideals in view, I would suggest :

1. The developing of Msowera (now used exclusively for deformed " burnt-out " cases) for both " burnt-out " and infectious cases.

2. Opening a camp at Chahudya for infectious cases.

3. The opening of treatment centres at Makuyu, Tunguri, Chebedya, Mulali and Kongwa.

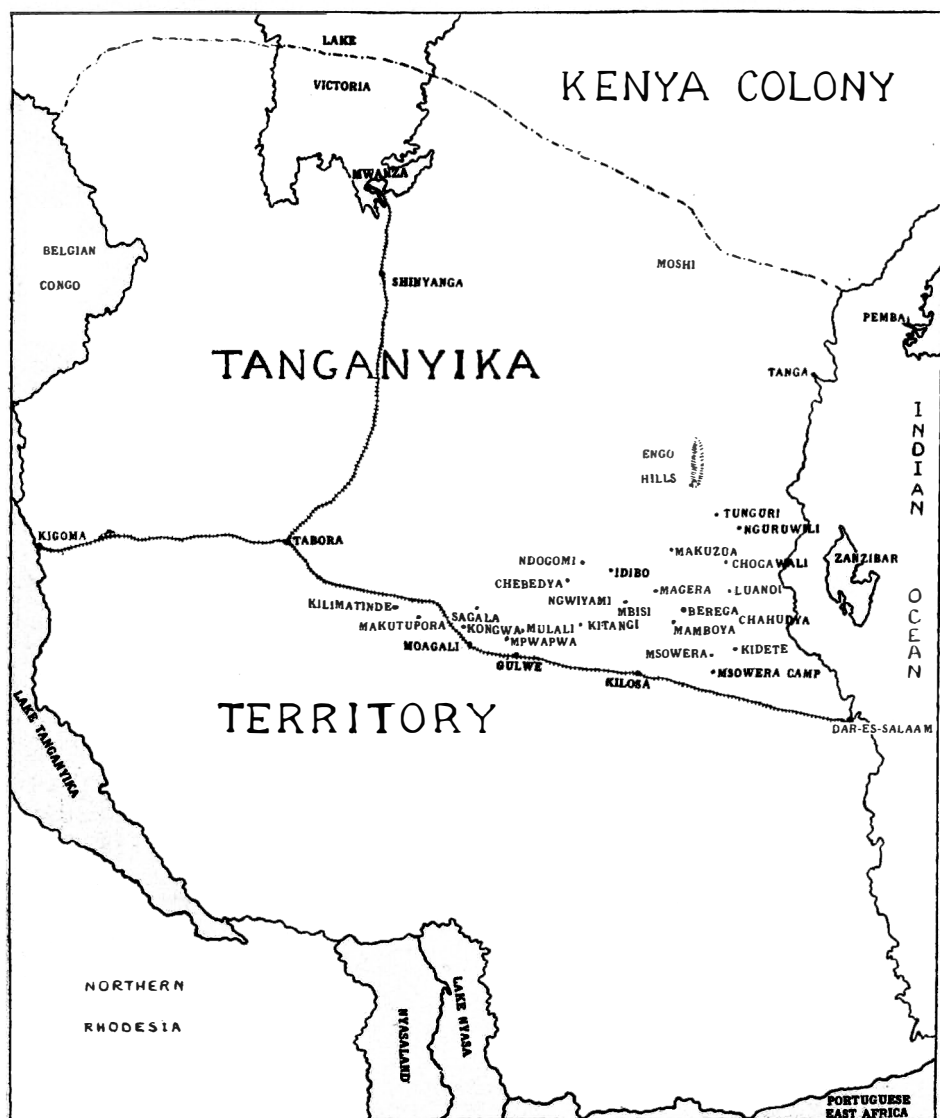
Even then only a small area will be thus covered, the vast northern and central areas remaining untouched. Sooner or later these areas will have to be provided with camps and centres of their own. In the central area, the leprosy incidence is certainly lower than in the Ukuguru district, but I believe in the northern area there is no difference.

Treatment centres have recently been established at Mamboyo and Idibo. At Berega, the centre has been moved further away from the village and now consists of treatment and preparation rooms. The Mamboyo centre consists of treatment and preparation rooms under one roof and separate huts where patients from a distance may stay for a short time. The Idibo centre consists of treatment and preparation rooms.

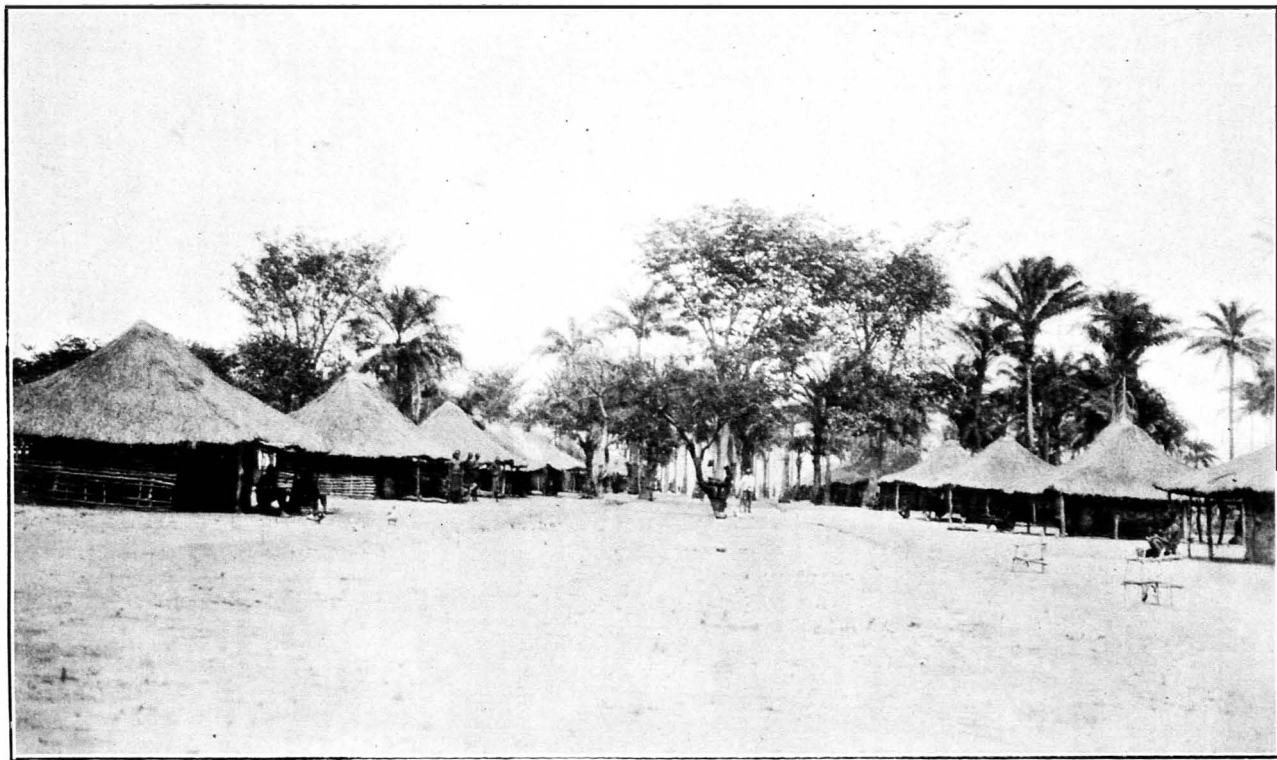
The result of treatment has been satisfactory and encouraging. The chief specific treatment was trichloroacetic acid and hydnocreol. Pot. iod. is given in selected cases under control.

#### MSOWERA CAMP.

There have been two deaths among adults and two children, bringing the number of inmates down to 15. Recently, there has been one admittance and the number now stands at 16. The camp is visited fortnightly. The patients are as healthy as they can be and seem content and cheerful.



SKETCH MAP SHEWING STATIONS WHERE LEPROSY WORK IS BEING CARRIED ON BY THE CHURCH MISSIONARY SOCIETY IN CENTRAL TANGANYIKA.



BIBANGA, BELGIAN CONGO. A STREET IN THE CAMP.



## Some Facts about Leprosy in the Katanga, Belgian Congo.

E. R. KELLERSBERGER,

ON January 9th, 1931, there was opened at Bibanga, one of the first organised leprosy colonies in the Belgian Congo, and so far as is known, the first real colony in the Katanga. This is the vast and rich province in the south-east of the Congo, bounded on the south and east by Rhodesia and Tanganyika. Bibanga lies in the high and comparatively healthy Lomami District, in the north-west corner of this province, in the midst of a rich agricultural and pastoral region.

As in other countries, so in this country, a sufferer from leprosy is branded for life, and is a social outcast, though not in as full a sense as in more civilised countries, where definite laws are in force. Up to the time of writing, practically nothing has been done for leprosy in the Congo, though a beginning is being made now, and it appears that the work is being done mostly by the Protestant Missionary Societies and their medical services. No one knows how many cases there are in the colony—possibly thousands. The recent statement made by Dr. Schwetz, of the Government service, that in this section of the Katanga there were practically no cases, is far from true. The sufferer is, more or less, ostracised when leprosy is manifest, yet, in the earlier cases, the disease is very often unrecognised or hidden, and there is a free mixing with the non-infected population and this constitutes a real menace.

Ever since the founding of this medical post of the A.P.C.M. (American Presbyterian Congo Mission) in 1918, patients have come here sporadically, but never received much encouragement. In September, 1930, on return from furlough in America, the news spread that there was hope for those suffering from leprosy, and they began to crowd into our dispensary here. By December, the Belgian Administration gave permission to open a camp. All preliminary clearing and the construction of the first 40 temporary houses of mud, stick, and grass, was done by the territorial agent, and the chiefs of the surrounding tribes. Since the opening of the camp, the Government of the local district has contributed over 6,000 francs from the "caisses des chefferies," but on account of the general depression this has been discontinued this year, and no further definite support promised. However, some anti-leprotic drugs are being furnished by the district and

provincial services. All houses since built have been erected by the inmates themselves. On account of the good soil, the camp has become essentially an agricultural colony, and largely self-supporting as regards food. Out of 208 inmates, only 30 receive at present a small weekly ration (1.50 francs) and a small amount of salt. Almost from the beginning, the cases were limited to this district, with an approximate area of 80,000 square miles, and an estimated population of 500,000 people. Rules of entry have been strict, though no fees are required. The camp is kept clean by the patients themselves as well as the roads leading to it; a definite organisation headed by the graduate nurse and a self-chosen council of eight men keeps good order. The colony is three miles from Bibanga, or five minutes by a good auto road; isolated, and yet very accessible. With almost 500 cases registered at the Bibanga Dispensary, and 216 so far accepted at the colony, it seems safe to say that in this district there are more than a thousand sufferers. This is a rough estimate.

Most of the support for this work has come from the American Mission to Lepers, New York City; other help from private individuals and also from the Colonial Government, the Comité Spécial du Katanga, and the British Empire Leprosy Relief Association.\*

An attempt has been made to classify the cases according to the report of the Leonard Wood Memorial Conference in Manila, P.I. This is the acknowledged revised classification adopted the world over. Of 217 cases, 149 cases were grouped as cutaneous, 24 as neural, and 44 as mixed cases. These have again been sub-divided into cutaneous,  $C_1$ —40 cases; cutaneous,  $C_2$ —73 cases; cutaneous,  $C_3$ —32 cases. The mixed and neural types were more difficult to group. Many of the last two mentioned groups showed enlarged ulnar nerves, and a number had loss of toes and fingers, and other deformities.

Treatment up to now has been almost entirely by mouth, using the hydnocarpus anthelmintica oil supplied from the Siam Medicinal Works, Bangkok, through the courtesy of the American Mission to Lepers. We began with two cubic centimeters a day, and increased as tolerated. Recently intramuscular injections of alepol, graumanyl and anti-leprol have been given twice a week, ranging from two to five c.cm. a dose. In the near future, we are going to use the intradermal method with moogrol plus 4 p.c. creosote furnished by the British Empire Leprosy Relief Association.

\*B.E.L.R.A. has furnished drugs for the treatment of Leprosy but does not give grants to stations outside the Empire.

It appears that the intradermal method is especially useful in early cases with only a few skin lesions. Treatment by mouth is better borne and liked, also more economic. Some patients who have been here over a year have shown remarkable changes ; in some cases, all the lesions have faded, and there has been a large gain of weight, and a general improvement that is accompanied by a new mental and spiritual outlook also.

Concurrent diseases especially have been dealt with. Here it has been trypanosomiasis, ankylostomiasis, schistosomiasis, ascariasis, malaria, itch, and sometimes venereal diseases, etc. This phase of the work is very important. Each house has a simple toilet, and the village is a model one as regards cleanliness, and there are very few mosquitoes. Efforts are being made to separate children, especially the older ones. So far, all the structures are temporary, and as yet there are many in the colony who are not suffering from leprosy. Precautions are imposed, and later it is hoped to isolate the children as far as possible. At present, as well as the 211 cases in the colony, there are 111 additional inmates as follows : 52 non-leprous wives with their affected husbands, and 4 non-leprous husbands with their wives. There are 37 girls and 18 boys untainted in these leprous families. Total population, 322 persons.

Most of the work of this colony lies in the future, and it is hoped that in a few years it will be on its feet, well equipped, a blessing to hundreds of the world's outcasts.

## Grants for Leprosy Work.

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

### NYASALAND.

Universities Mission to Central Africa, Likwenu      £10

### NORTHERN RHODESIA.

Rev. G. Hewitt, Fiwila Mission ...      ...      £50

Applications for financial aid will be sympathetically considered by the Committee, and all applications should in the first place, be sent to the Director of Medical Services of the Colony concerned, who will forward them to the Secretary of the Association.

## INDIAN SECTION.

**Leprosy in Women: Some Clinical Observations.**

ISABEL KERR.

**P**ROVIDED the chances are equal, the percentage of women infected by leprosy is similar to that of men. In Africa, where women live under the same conditions as men, exposing themselves to the outside world in the same degree, it is found that the proportion of leprosy men and women is equal. In China, in the neighbourhood of Canton, half to one-third of the people infected with leprosy are women. At Culion, Rodriguez gives 66 per cent. of men to 33 per cent. of women. Rogers and Muir give the percentage of leprosy women in India as 28. Here, at Dichpali, out of 400 inmates, 18 to 20 per cent. are women. This may be due partly to the fact that in a Mohammedan State, where the Zenana system is a mark of respectability, women who can afford it prefer seclusion. Mostly women of a low caste are exposed to infection and these form a large percentage of our female patients here. These women of the lower castes work as coolies and for this reason would be likely to come in contact with infective leprosy. But even among women of this grade of society, infection is less prevalent than among men of the same grade. Women on the whole do not come into sufficiently close contact with other people or with one another to be likely to get infected. Because of their seclusion after the advent of puberty, fewer women than men are infected in later life.

The infections group themselves round the earlier years of life, and on examination the advance of the disease is found to depend on sex-development, child-bearing, and catamenial changes—always allowing for complicating factors such as chronic and acute complicating diseases, poor nutrition, etc., all of which will render the body tissues less resistant to leprosy. In a country like the Deccan where there is a fair amount of variation between night and day temperature, and the basal metabolic rate is presumably good, the progress of the disease is in many cases slow. We are, therefore, in a degree able to follow the advance of the disease and to detect the reasons thereof.

*Leprosy before Menstruation.*

Of the 16 small girls here under the age of puberty (not including cases of belated menses) the disease is in the

maculo-anæsthetic stage in 14, while in the remaining two it is cutaneous. Among the macular cases, a few are bacteriologically positive—*M. lepræ* being sometimes found in small numbers where there is thickening of the skin; but generally the patches are depigmented or appear as small, roundish areas which are scarcely visible and in which the lanugo hairs are unaffected. These children have been infected by their leprous relatives. Beyond their poor hygienic conditions, no complications can as yet be detected which is sufficient to break down their natural resistance further and cause a more virulent type of the disease. Before menstruation, the macular cases do well under hydnocarpate treatment. As many as 100 per cent. may be expected to recover. If complicated by syphilis, this treatment is difficult and prolonged while if menstruation is delayed, the patient would appear to have a better chance of improvement. Concomitant disease and menstrual periods tend to aggravate the leprosy and increase its virulence.

#### *Effects of Menstruation upon Leprosy.*

Among the direct causes of lepra reaction leading to aggravation of lesions, menstruation appears to play an important part. So far as the writer knows, the actual menstrual period has not been recorded as a cause of the first symptoms, or of the later exacerbations of, leprosy. This is possibly due to the fact that menstruation, in this country, at least, often synchronises with marriage, and the result is that symptoms of the disease are considered to be due to the beginnings of married life. In women, menstruation and maternity are the most serious causes of calcium deficiency in the tissues. Of the 100 women who are, or have recently been in this Home, five definitely trace the onset of leprosy in them as coincident with their early menses, while two of them particularise that symptoms appeared with their first period. Others assert that fresh lesions and aggravation of old lesions took place concomitant with their early menses. The writer has not actually witnessed the onset of the disease with the first menstrual period, but the aggravation of lesions during menstruation has often been observed. It is quite possible to watch the rhythmical advance of leprosy in many women during their menses.

#### *Menstrual Lepra Reaction.*

Lepra reaction is common in women whose menses is normal or increased in amount. All the symptoms of reaction may be present—temperature, fresh lesions, in-

inflammation of old lesions, while arthritis and neuritis may be slight or severe. Ephedrine or adrenalin may allay the nerve pain, but the cutaneous symptoms do not yield readily to potassium antimony tartrate. The latter pass off with or soon after the period. Preventive treatment only is effective. This menstrual lepra reaction may not be visible clinically. In many cases, it can only be detected by the sedimentation rate of the erythrocytes. This index should be checked as soon as the period commences. It may be raised 10 to 25 units higher than the patient's ordinary index. It is of importance to point out that the women in whom this periodic lepra reaction is found, have already a high S.I., whether the reaction is clinical or elicited by the S.I.

### *Menstrual Irregularities in Leprosy.*

Menstruation among women suffering from leprosy is a subject of interest not only because it aggravates the disease, but also because of the variety of periodic disturbances found in connection with the disease. These variations would appear to be the result of two conditions :

1. A chronic leprous oöphoritis sufficient to cause amenorrhea and sterility (Glueck and Wodinsky).

2. A low alkali reserve concomitant with disturbance of the calcium blood level.

In women over 30, the periods may disappear with the first signs of the disease, *i.e.*, an early menopause. One would expect menstruation to be belated in skin cases which develop at an early age. But this is not always so. It is certain, however, that a normal or profuse menses if caused by a low calcium blood level, will militate against the improvement of the patient under treatment, while, if she remains untreated the progress of the disease will be accelerated. Under such conditions, we find that maculo-anæsthetic leprosy tends to develop into skin leprosy.

### *Relation of Syphilis to Menstrual Irregularities.*

Diseases which cause or are caused by calcium deficiency, readily affect the nervous system. An example of this is seen in tetany. In normal healthy persons, tetany is not found. If, however, the calcium level is disturbed by ulceration or dysenteric conditions, spasms due to stimulation of the myoneural junctions are manifest. Tetany does not occur in all cases of ulceration or dysentery. The exciting cause is an organism and the predisposing cause is lowered calcium level. Administration of calcium relieves the spasms. The exciting cause of leprosy is *M. lepræ*

and one of the predisposing causes, if not the predisposing cause, may be a deficiency of calcium in the blood. Syphilis hastens the progress of leprosy from its earliest stages and predisposes to secondary nerve leprosy. It is extremely difficult in the writer's experience, to prevent skin leprosy from passing into the nerve type when syphilis is a complication.

Syphilis, more than any other complication in leprosy, seems to aggravate menstruation and cause this physiological process to become a morbid condition. The Kahn Test is positive in over 50 per cent. of the cases whose periods are apparently normal or increased, while it is positive in less than 25 per cent. of amenorrhoeic cases. Both menorrhagia and normal menses are lessened by calcium administration.

Amenorrhoea, in the writer's opinion, is rarely due to syphilis directly. Signs of ovaritis—possibly leprotic—can be elicited in a large number of women and girls whose menses is absent or repressed. Amenorrhoea may also follow lepra fever and consequent calcium depression just as temporary amenorrhoea follows febrile conditions such as scarlet and typhoid fever. This type of amenorrhoea invariably yields to treatment.

In the 80 cases at present under observation, the mucous membrane of the vulva was bacteriologically positive in three cases, *i.e.*, about 4 per cent. This was due to encroachment of skin lesions on the mucous surfaces. In no case were *M. lepræ* found in the vaginal discharges. This latter finding is a contrast to that of Babes, who reported 27 per cent. of his cases bacteriologically positive. His findings have been corroborated by other investigators. Here, at Dichpali, no bacteriological examinations of the internal sex organs were made. The ovaries were palpated per rectum in these 80 cases and classification made according to the presence or absence of tenderness of these organs.

1. *Normal menses with no ovarian tenderness.* Of these, there were 19 cases, *i.e.*, 24·6 per cent.

2. *Normal menses or menorrhagia with ovarian tenderness.* Of these, there were 21 cases, *i.e.*, 27 per cent.

3. *Amenorrhoea with ovarian tenderness.* Of these, there were 27 cases, *i.e.*, 33·8 per cent.

4. *Amenorrhoea with no tenderness.* Of these, there were 12 cases, *i.e.*, 13·8 per cent.

In about half of these women, leprosy began after confinement—a factor which had to be taken into account concerning the cause of the pelvic pain.

*Effects of Calcium Lactate and Sodium Bicarbonate on these Irregularities.*

In Class 1, that is among the apparently normal cases, amenorrhea was induced in one case of active skin leprosy.

In Class 2, amenorrhea was induced in two cases, while in two others, the duration of the periods was shortened from four days to two days. In one case of severe menorrhagia whose periods recurred fortnightly, each time with a debilitating reaction, the periods were reduced to once a month and appear to have become normal. Lepra reaction ceased. On one occasion, Ext. Hydrastis was given to this patient.

Of the amenorrhea cases, partial or complete, there were 39, *i.e.*, nearly 47 per cent. Among those who complained of tenderness on palpation of the ovaries, two reported slight improvement of partial amenorrhea. Both were over 30 years of age and had had children.

Among those who had amenorrhea with no ovarian tenderness, *i.e.*, amenorrhea apparently due to disturbed chemical balance of the blood, improvement was marked. Nine out of twelve (78 per cent.) improved. One case had had complete amenorrhea for two years; two were cases of belated menses, while the others had been having diminished discharge once every few months.

*Treatment.*

All the female patients here receive creosoted ester hydnocarpate by injection twice a week. This is given intradermally and intramuscularly. In contrast to the male patients, the skin in the case of the women is soft and easily pierced, but their assimilation of the oil does not appear to be so rapid as in the case of the men. For this reason, only a small proportion take injections regularly. A year ago, on taking over charge of the female patients, the writer made inquiries regarding menstrual disorders. All disturbances were noted and for six months hydnocarpate treatment was persisted in, while attention was paid to complicating diseases in the usual way. Skin reactions were controlled by rest and potassium antimony tartrate. Six months later the menses were checked again. No radical changes could be detected and no cases of belated menses had begun to menstruate. Then calcium lactate and sod. bicarb. were added to the treatment—the calcium salt up to 30 grains per diem., while the sod. bicarb. was pushed so as to maintain the urine alkaline or neutral. Sod. bicarb. when given alone and in sufficient dosage to keep the urine



alkaline, seems to cause neuritis. Injunctions were given to the patients to drink ample water with the salts. This led to a considerable increase in the amount of urine passed by the patients and demonstrated that the kidneys were hitherto insufficiently flushed.

At the same time, these salts were added to the treatment of 30 men. On the whole, the men responded more quickly to the alkali than the women. In them, the urine was more easily kept alkaline, and the S.I. improved more quickly. It would appear that the women have a lower alkali reserve than the men and, therefore, a lower calcium blood level. In both sexes, clinical lepra reaction was kept at a minimum and in several cases it disappeared, while in a few it reappeared if the alkali was suspended. No chemical estimation of blood calcium could be done here. This article, therefore, is confined to clinical details.

Menstrual disorders among leprosy women can be an index of low calcium blood level. Previous to the use of calcium and sod. bicarb. as adjuvants in treatment, cutaneous and nerve lepra reactions were occurring periodically in 25 per cent. of the cases. Both have practically disappeared. It is worthy of note, however, that the cases who are really progressing are those who show no sign of menstrual lepra reaction whatsoever, but on the contrary, show a slowing of the sedimentation rate with their periods.

Administration of calcium and sod. bicarb. seem to compensate for relative deficiency of hormones (parathyroids and adrenals) caused by leprosy, or by its complications, or by physiological processes such as menstruation and maternity. If compensation is not made for this deficiency, the physical tone of the body is lowered and the result is aggravation of the leprosy.

In 90 per cent. of the women the urine keeps acid if alkali is not given. In the remainder it is alkaline. In a few cases of advanced skin leprosy, this alkalinity is constant. This may be due to renal dysfunction.

When menstrual lepra reactions cease the muscular tone in a woman improves. One would naturally expect that when she is relieved of a periodic lepra reaction which invalidated her once, if not twice a month, her resistance to a chronic disease would be very much increased not by the treatment of this symptom of lowered vitality, viz., lepra reaction, but by the general building up of her body tissues.

These alkaline salts are not retained in the system and must be given repeatedly.

## The Uses of Mercurochrome Soluble 220 in Leprosy.

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*(Reprinted from Leprosy in India, July, 1932).*

**I**N 1925 an article by Denney, Hopkins, Wooley and Barentine was published giving the results of the intravenous use of Mercurochrome in the treatment of leprosy.

Their conclusions were as follows :—

“ 1. Mercurochrome soluble 220 has not proved to be specific for leprosy.

“ 2. Mercurochrome soluble 220 has been helpful in checking rapid retrogression in leprosy.

“ 3. Mercurochrome soluble 220 has been of value in the treatment of ulcers, the result of disintegrating tubercles.

“ 4. Mercurochrome soluble 220 has been helpful in the healing of neuro-trophic ulcers.

“ 5. Mercurochrome has not been helpful in checking the unfavourable progress of pulmonary tuberculosis in leprosy ; on the contrary, this complication was apparently aggravated.”

More recently an article by Rao and Roy (1932) mentioned promising results in 12 cases of leprosy.

We have been using Mercurochrome at the Gobra Hospital for some months and have found it useful given either intravenously or intradermally.

In all 35 cases have been treated and the results of treatment are given herewith in brief.

1. Soorja Kumar Saha—C2. Sedimentation index rose from 28 to 40 after vaccination. After each dose of intravenous Mercurochrome 5 c.c. temperature rose for one day to over 100. Sedimentation index now 27. Nodules swell up and burst with rise of temperature and sedimentation ; as they heal up these come down.

2. Soshi Kumar Roy—C3. No rise of temperature after 10 c.c. intravenous Mercurochrome except after first dose when rise to 103. There was some slight albuminuria and gum pains next day which disappeared the day after. Pain in the body disappeared with first injection of 10 c.c. though it had previously lasted more than a month and had not yielded to diathermy.

3. B. N. Dutt—C3-C2. Constant rise of temperature between 103 and 104 for two and a half weeks. Temperature normal in three days after one injection of 10 c.c. Mercurochrome. Injection has been given once a week from January

28th to May 14th. Condition much improved. Skin clearer and swelling of legs subsided.

4. J. Ward—C3. Mercurochrome 3 per cent. solution intradermally in doses of 2 c.c. twice a week given since April 7th, 1932 ; sedimentation remaining between 9 and 13. Eyes and general condition of patient considerably better.

5. Akhil Ch. Sarkar—C3. Running low temperature. Mercurochrome given intravenously 5 c.c. since February 24th once a week. One dose of 20 c.c. given on March 28th caused sedimentation rise from 14 to 28 ; therefore, only 5 c.c. given. 2 c.c. 3 per cent. solution given intradermally twice a week since April 27th.

6. Abeng—C3. Febrile rise from 100 to 101 daily for two weeks. 5 c.c. Mercurochrome intravenously followed by 8 c.c. three days later brought temperature to normal and all signs of reaction, swelling and bursting of nodules on left forearm, face and forehead, stopped.

7. S. Korban—C3. Pains in body. 5 c.c. Mercurochrome intravenously relieved pains, no rise in temperature. 15 c.c. on May 11th after which a few nodules on ears burst, and slight pain in gums. No albumen in urine. General skin condition (streptococcal) has improved.

8. Mounq Main—C3. Mercurochrome 2 c.c. 3 per cent. solution given first once a week, later twice a week, caused rise of sedimentation from 17 to 31, but fall to 15 after intermission for one week.

9. A. E. Dutt—C3. 2 c.c. of 3 per cent. solution, twice a week since April 12th. Nodules came on thigh. Skin much cleaner and less septic.

10. George Venture—C3. First 5 c.c. Mercurochrome given, later 10, then 15 c.c. Bursting of nodules after 15 c.c. Had very bad nerve pains which was only slightly helped by diathermy, but has lost these pains after Mercurochrome. Pain in gums and rise of temperature to 100.4 for 3 days after 15 c.c., but thereafter patient brighter and generally better.

11. J. Smith—C3. 3 c.c. then 4 c.c. Mercurochrome intravenously. Sleeps and feels better. Septic condition and swelling of feet very much better.

12. Janaki—C3. Temperature rising to 105 for ten days. From April 7th, Mercurochrome 5 c.c. intravenously. Fall of temperature to normal ; rise again to 100. After third dose of 5 c.c. fall of temperature to normal which continues last two weeks. General condition much improved.

13. Manindra Ch. Dass.—C3. 2 c.c. 3 per cent. solution Mercurochrome intradermally. After two injections rise

in sedimentation from 25 to 44: 5 c.c. followed by 7½ and 10 c.c. temperature remains normal, sedimentation 18, 17, nerve pains which were had before have subsided, though diathermy for two months had only slightly relieved them.

14. Benoy K. Das—C3. Mercurochrome intravenously was followed by disappearance of fever. Mercurochrome 2 c.c. 3 per cent. solution intradermally was followed by fresh nodules of left arm and pain of left ulnar; rise of sedimentation from 15 to 42. Subsequent injections twice a week; temperature normal sedimentation 23; Mercurochrome is now being given intravenously once a week and intradermally once a week. Skin is much cleaner and less septic, isolated nodules are bursting.

15. Amina Mahapatra—C3. Mercurochrome 5 c.c. intravenously three doses once a week, reaction in eye after third dose.

16. Sumbhu Karmakar—C2. Mercurochrome 2 c.c. 3 per cent. solution intradermally 5 doses; nothing noted yet.

17. Jogendra Das—C2. Mercurochrome 5 c.c. intravenously once a week since March 22nd; temperature rose to 103 for one day. After the next injection the temperature rose to 100; but after subsequent injections there was no febrile reaction. Sedimentation 46-36-30-29; lesions less prominent.

18. Profulla Chakrabutty—C3. Mercurochrome intravenously 3 c.c. temperature 100; later 4.5 c.c. no rise of temperature. Looks and feels much better. Sedimentation index fell from 70 to 57. Skin much cleaner.

19. Joynuddin—C3. Mercurochrome 5 c.c. intravenously once a week since February 28th. The first injections produced temporary pain in gums, but after the later injections this was less. Sedimentation index has gradually fallen from 65 to 22; slight rise of temperature to 100 after injections, nodules bursting from time to time.

20. Evers—C2. Mercurochrome 3 per cent. solution 2 c.c. intradermally once a week given from February 18th to May 15th; result is bursting of nodules.

21. Patal Ch. Das—C3. 5 c.c. Mercurochrome given intravenously for two months. Bursting of nodules after first, second and third injections, but not after the rest.

22. G. N. Laha—C2. Mercurochrome lower doses were given for the first five days then 10 c.c. intravenously. Slight rise of temperature, first 100 then 99. Running temperature stopped after first injection. Sedimentation index fallen from 42 to 16. General condition much improved. Streptococcal infection of skin is less.

23. Abdul Aziz No. 2—N2. Mercurochrome 5 c.c. intravenously once a week and 10 c.c. once a week since March 10th. Later 2 c.c. 3 per cent. solution intradermally. Patches more marked and edges thicker after intravenous injections. Nothing noted so far after intradermal injections.

24. B. Rowland — C3. Mercurochrome 2 c.c. of 3 per cent. solution twice a week intradermally; nodules bursting and drying up; general condition improved especially eye. Sometimes after injections a little pain in forehead lasting one or two days.

25. Upendra Nath Mondal—N2. Mercurochrome 5 c.c. once a week; at first rise of temperature to 102, later to 99 or remained normal; macules become more prominent and new patches appeared. Arms become more anaesthetic and weaker and fingers bent; later given 2 c.c. 3 per cent. solution intradermally twice a week.

26. Chandlow Choni—C3. Mercurochrome 2 c.c. 3 per cent. solution twice a week intradermally one month; no marked change.

27. A. K. Maitra—C2. 2 c.c. 3 per cent. solution twice a week since April 1st; skin has become much better, with disappearance of a general chronic streptococcal dermatitis; eye inflammation gone; general condition much improved. Small slight patches appear in places, which are again infiltrated with the drug intradermally.

28. S. P. Kurti—C3. Intravenous injections of Mercurochrome 10 c.c. once a week for three months. Rise of temperature to 103 lasting one day; deep subcutaneous nodules bursting. Albumin in urine lasting 24 hours after first two injections but not subsequently. Few new patches appeared. General condition better. Sedimentation 10-15.

29. Tesruddin—C2. 5 c.c. Mercurochrome once a week; later  $7\frac{1}{2}$  c.c.; then 10 c.c. six injections intravenously. Sedimentation index fell from 43 to 11 and irregular temperature stopped after third injection.

30. Majibar Rahman—C2. Mercurochrome 5 c.c. intravenously once a week, five injections; small patches appearing.

31. Thomas John—C2. Mercurochrome 5 c.c. intravenously; nodules burst; general condition better. Superficial nodules at first burst and healed up, then deeper nodules burst.

32. M. Chowdhury—C2. Mercurochrome first dose of 10 c.c. caused vomiting, purging and inflammation of eyes, swelling of gums, later 5 c.c. caused pains in gums lasting 15 minutes only and pain in eye for a short time only; a

week later 10 c.c. without symptoms. Eye reacting a little—less vision and pain—after injections for a day and then improvement.

33. C. Leicester—C3. Mercurochrome first intradermally with no marked effect. Intravenously 2 c.c. gave pain in eyes and nerves but subsequently both were better. This was repeated three times with some improvement in eyes.

34. Alam—C3. Mercurochrome intravenously 3, 5,  $7\frac{1}{2}$ , 10 c.c. ; patient appears better and more active.

35. Abdul Rahaman—C3. Fever for eleven months with reaction and bursting nodules. After four injections of 10 c.c. of Mercurochrome temperature became normal and patient recovered from reaction.

36. Miss E.—C2. Lepra reaction for 23 days. High temperature. Swelling up and erythema of lesions all over body. Blood negative for malaria. Quinine sulphate, alkalis, etc., administered without benefit. Mercurochrome 3 c.c. of 1 per cent. solution given intravenously ; temperature dropped to normal. General condition good. Local signs of reaction passing off. Sedimentation index, which was at 13 at beginning of reaction, gradually rose to 45.

### *Discussion.*

The signs and symptoms and other effects connected with the administration of Mercurochrome may be discussed under three headings :—

1. First the immediate unpleasant effects unconnected with leprosy.

(a) There is generally a rise of temperature from 1 to 5 degrees above normal, varying with the size of the dose and the sensitiveness of the patient. It will be noticed, however, that tolerance is produced in practically every case and that if 3 or 5 c.c. of a 1 per cent. solution in distilled water are given to begin with it is generally possible to raise to 10 or 15 c.c. for a patient of about 10 stones weight.

(b) Another symptom is painful and inflamed gums. One might suspect this to be due to the mercury contained in the drug ; but obviously this is not so, as only the first few doses produce this symptom and as a rule subsequent doses do not. It would appear rather that the pain and inflammation are due to the presence of some septic infection of the gums which is first exacerbated and then overcome by the drug.

(c) Diarrhœa, vomiting and other signs of gastrointestinal irritation are not uncommon if 10 c.c. of a

1 per cent. solution is given as the first dose. These symptoms are probably also due not to any irritation of the drug but to its stirring up of septic infections in the stomach. Because of these symptoms and the febrile reaction often produced by large doses it is well to begin with small doses.

(d) Albuminuria should be considered a contra-indication to Mercurochrome. It will be noticed, however, that only in one patient (Case 2) did this sign occur after injection and then after the first injection only. The urine was examined as a routine before and after the first few injections at least. With regard to the undesirable effects of Mercurochrome (apart from those connected with leprosy) it may be said that these are probably due to lighting up of already present septic infections, and that the drug tends to eliminate these infections at least to the extent that after the first few doses injections are followed by no unpleasant symptoms.

2. Secondly, we shall consider the immediate beneficial effects of Mercurochrome in stopping reactions, clearing up septic foci and improving the general health of the patient.

(a) In stopping reactions. In many of the cases recorded above, Mercurochrome was given with the object of stopping lepra reactions, as in cases 3, 5, 12, 14, 22, 29, 35 and 36. The effect was most marked in the last two cases as they were suffering from very severe reactions. The importance of having a drug which will stop lepra reaction cannot be over-emphasised. Previous reference has been made by one of us to the beneficial effect of potassium antimony tartrate (Muir, 1927) in reaction but Mercurochrome seems to be much more powerful in stopping reaction. In Case 35, a febrile reaction lasting for eleven months was brought to an end by four injections, and there was a marked improvement even after the first dose.

(b) Another marked benefit is the clearing up of septic dermatitis, a condition very common in leprosy and often wrongly supposed to be part of the leprous condition. This improvement was noted in Cases 3, 7, 9, 11, 14, 18, 22 and 27. In many patients, the removal of this condition causes an improvement in the leprous lesions themselves.

(c) Relief of muscular, joint and nerve pains is another marked effect of Mercurochrome. In many of the cases arthritic and muscular pains disappeared in a spectacular manner, the most striking cases being 2,

7 and 11. Nerve pains were relieved in 2, 10, 13, which were the only cases in the series suffering from this condition. In these three cases treatment with diathermy had been tried with some relief, but Mercurochrome produced much more striking results.

(d) Eye involvement is one of the most serious complications in leprosy. In Cases 4, 27, 32 and 33, there was marked improvement in the eye condition, though in some of them there was a temporary increase of the eye symptoms after the earlier injections. In cases of serious eye infection it is well to begin with even smaller doses than usual and to increase the dose more slowly.

### 3. The effects on leprosy lesions.

(a) In Cases 1, 8, 9, 10, 20, 21, 24, 27 and 31 swelling up, abscess formation and bursting of nodules was produced. It was significant, however, that in most of these patients this phenomenon was associated with general improvement of the health. In some of these cases, the more superficial nodules burst first, the deeper ones liquefying and coming to the surface later. It was noticed that after their liquefaction and bursting the deeper nodules were no longer palpable. Although this process was caused by intravenous injections in Cases 1, 10, 21, 28 and 31, it was caused in the others and to a much more marked degree by intradermal injections. The liquefaction took place in nodules distant from the sites of intradermal injections. It was noted that liquefaction and bursting was accompanied by a rise in temperature and in the sedimentation index which subsided after the healing up of the abscesses.

(b) Similar to the abscess formation in nodules was the swelling up of old lesions, especially at the margin and the appearance of new lesions where they had not been previously visible (Cases 23, 25, 27, 28 and 30).

It may be mentioned in this connection that in leprosy many parts of the skin show no visible sign of disease in parts where examination of sections demonstrates that the disease is really present. It must not, therefore, be supposed that the appearance of new lesions is necessarily a bad sign. This, like the abscess formation in nodules would seem to be an attempt of nature to deal with and destroy existing lesions.

In a few of the cases treatment has not been carried on long enough to produce improvement, but in only one case (25) was the patient really worse. No case with tubercular



complication was treated ; but Denny and his co-workers obtained unfavourable results in such cases.

### *Conclusions.*

1. Mercurochrome soluble 220 may be given safely in almost all cases of leprosy. Albuminuria and tuberculosis are contra indications.

2. Small doses should be used at first, 3 or 5 c.c. of a 1 per cent. solution in distilled water for a 10 stone adult ; and according to the tolerance of the patient the dose should be gradually or rapidly increased to 10 or 15 c.c. Injections should be given intravenously once a week, or, if urgent symptoms are present, twice a week for the first few smaller doses.

3. Mercurochrome is found useful in clearing up septic conditions which are so frequently present as complications in leprosy. Among these may be specially mentioned pyorrhœa, gastro-intestinal infections, chronic inflammations of the skin, various painful rheumatic conditions and septic ulcers. The removal of these infections causes improvement in the general health of the patient and is a decided help in dealing with the leprous infection.

4. Mercurochrome gives marked results in clearing up the allergic condition known as lepra reaction or lepra fever. It is difficult to say whether this is due chiefly to the removal of septic infections or to a more direct effect on the allergic condition itself.

5. It is yet too soon to say to what extent Mercurochrome will prove useful in clearing up lepromata. It has a marked effect in causing liquefaction, abscess formation and evacuation of cutaneous and subcutaneous nodules ; but care must be taken not to produce this process too rapidly, as the general condition of the patient is temporarily lowered, improving again when the abscess heals up. Intradermal injections appear to have a stronger power of producing abscess than intravenous injection. In addition, new patches appear and old lesions become more prominent as the result of Mercurochrome, though there is reason to believe that this is generally not an exacerbation of the disease but rather a part of a process of healing.

A good combination of treatment may be to give intravenous and intradermal injections alternately, once or twice a week infiltrating any fresh lesion that may appear or old macules, etc., that may become more prominent.

We have found a 3 per cent. solution most suitable for intradermal injection. This is given by the method described

by one of us (Muir, 1932). The usual dose is from 1 to 3 c.c. For intravenous injection a 1 per cent. solution should be used.

This is a preliminary report based on observations in 36 cases. It must be realised that the use of Mercurochrome in leprosy is still in the experimental stage; but if the precautions mentioned above are observed there is little danger of untoward results being obtained by careful workers.

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The following publications can now be obtained from the Association :—

**Leprosy Review**, Vol. III, Nos. 2 and 3, April and July, 1932. Issued quarterly by the Association. Price 2s.

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# LEPROSY REVIEW. VOLUME III.

## INDEX OF TITLES.

	PAGE
A Journal in a Federated Capital ... ..	137
Country Clinics or Dispensaries for Treatment of Cases of Leprosy ... ..	58
Duties of a Nursing Superintendent in a Leprosy Settlement ... ..	126
Extract from Current Literature ... ..	132
Garkida Agricultural-Industrial Leprosy Colony ... ..	50
Grants for Leprosy Work ... ..	31, 80, 164
Histamine Test as an Aid in the Diagnosis of Early Leprosy ... ..	18
Hydnocarpus Wightiana ... ..	22
Investigation of Certain Serological Reactions in Leprosy ... ..	28
Leprosy in Argentina ... ..	107
Leprosy in Hawaii ... ..	9
Leprosy in Korea with Special Reference to the Soonchun Leprosy Colony ... ..	81
Leprosy in the British Solomon Islands ... ..	157
Leprosy in the Gold Coast ... ..	94
Leprosy in the Rhodesias ... ..	25
Leprosy in the Southern Bahr-el-Ghazal, Anglo-Egyptian Sudan ... ..	3
Leprosy in Ukuguru District, Tanganyika ... ..	159
Leprosy in Women : Some Clinical Observations ... ..	165
Literature ... ..	45, 90, 179
Methods of Campaign Against Leprosy in India (Abridged) ... ..	32
Note on the Treatment of Leprosy by Intradermal Infiltration... ..	129
Note on the Treatment of Some Common Leprous Lesions of the Ear, Nose and Throat ... ..	84
Notes on the Use of Glycerine for the Alleviation of the Pain Reaction in the Subcutaneous Administration of Sodium Hydnocarpate ... ..	121
Organisation of Anti-Leprosy Measures in Surinam ... ..	147
Place of Local Self-Government in Leprosy Home Administration ... ..	105
Reviews and Notices of Books ... ..	45, 90
Some Facts about Leprosy in the Katanga, Belgian Congo ... ..	162
Some Observations on the Influence of the Hydrogen-ion Concentration on the Pain Reaction in the Administration of Sodium Hydnocarpate Solutions by Subcutaneous Infiltration ... ..	67
Treatment of Dysentery ... ..	113
Treatment of Leprosy by Means of Alepol Tabloids ... ..	144
Uses of Mercurochrome Soluble 220 in Leprosy ... ..	171

## INDEX OF AUTHORS.

	PAGE
Alfred, E. S. R.	144
Badenoch, A. G.	144
Chatterji, S. P.	171
Cochrane, R. G.	25
Cruikshank, A.	3
Dixey, M. B. D.	94
Fidanza, E. P.	107
Fletcher, A. G.	58
Jackson, J. T.	67, 121
Joseph, W. C.	22
Kellersberger, E. R.	162
Kerr, Isabel ...	165
Lampe, P. H. J.	147
Manson-Bahr, P.	113
Maybury, L. M.	157
McKean, J. Hugh	105
Muir, E.	32, 129, 171
Plantilla, F. C.	18
Rao, G. R.	84
Robertson, Russell L. (late)	50
Rodriguez, J.	18
Slack, E.	28
Thornton, M.	126
Wallace, C. A.	159
Wayson, N. E.	9
Wilson, R. M.	81