

# LEPROSY REVIEW

The Quarterly Publication of  
THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION.

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VOL. XI. No. 4.

OCTOBER, 1940.

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## Principal Contents:

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Some Basic Principles in  
Leprosy Treatment.

Leprosy Cases in the British  
Isles.

Intranasal Treatment in  
Leprosy.

Reviews      Reports

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Edited for the British Empire Leprosy Relief Association, 115 Baker Street, London, W.1., by the Medical Secretary, to whom all communications should be sent. The Association does not accept responsibility for views expressed by the writers.

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## EDITORIALS

One of the enigmas of leprosy is that it does not spread in England at the present time in spite of the fact that not infrequently those who have acquired the disease abroad return to this country, where no restrictions are placed upon their movements. Some have sought to explain this phenomenon on the ground of racial immunity of the European as compared with the native of countries like Africa or India where leprosy is endemic. But, as was pointed out in a recent number of this Journal (Jan. 1940), direct evidence is rather in favour of the European being less resistant to leprosy than the African or Indian. If it is claimed that leprosy is a disease of over-crowding, low sanitary standards and malnutrition, we cannot say that all is well in England in these respects. It is often asserted that leprosy is no longer endemic in Western Europe; but what of Portugal with its 3,000 known lepers? In the conclusions on page 172 it is pointed out that the great majority of those who return to this country with leprosy are of a social position that permits them to live under favourable sanitary arrangements and to avoid overcrowding, and that many of them have reached an age when they are unlikely to come into close and prolonged contact with children. If these are the main considerations that hold back the endemicity of leprosy in the more advanced parts of Europe, then what will be the effects of such trends of present day life as levelling down of social standards, closer contacts of all classes and races throughout the world, and the malnutrition which is likely to accompany and follow the present war?

. . . . .

Mention is made on page 169 of the interesting experiments with the vole bacillus carried out by Wells and Brooke. Attention was first drawn to this organism when it was found to be the cause of high mortality among voles. It is acid-fast and is said to resemble to a certain extent the organisms of tuberculosis and rat leprosy. Experiments show that inoculation with a culture of the vole bacillus immunised guinea pigs against strains of human and bovine tuberculosis and was considerably more effective in its protecting power than the B.C.G. strain. These results suggest the value of testing whether this newly found bacillus can similarly immunise against rat leprosy or even human leprosy.

. . . . .

Among the most hopeful signs in India at the present time are the efforts being made in certain places by educated and

trained Indians to help their poorer and more ignorant fellow countrymen. Government efforts do not and cannot reach more than the fringe of the poverty, disease and helplessness of the Indian village. But public-spiritedness is on the up-grade and the sporadic attempts which appear here and there are gathering force and their appearance is making others think. An example of this is shown in a small leprosy investigation and treatment centre begun recently in the Nizam's Dominions. The doctor, who had previously worked for years in a large mission leper settlement, realised that there were large numbers of lepers who for lack of space and funds could not be accommodated in this institution. He calculated that there were between two and four hundred thousand lepers in the Nizam's territories and only seven hundred of these could be accommodated in the institution.

He set himself to see what could be done to start small, nearly if not entirely self-supporting village leper settlements. A grant of 37 acres was asked for and received. Villages within a radius of 10 to 20 miles were surveyed, and about one per cent of the villagers were found to have leprosy. He has now 57 in-patients and 84 out-patients regularly under treatment. Of the in-patients 18 are self-supporting and pay two rupees a month for treatment, 13 are self-supporting, but get treatment free. They build their own huts in places allotted to them. The remaining 12 have to be supported by the doctor. He adds "the leper population is only too glad to avail itself of any help offered to it in the shape of treatment. We have proved to ourselves that it can be done cheaply and efficiently . . . . . Our treatment hall and laboratory is a wind-blown, ramshackle affair, whose roof flies off with every storm. It leaks during every monsoon and yet patients flock to us . . . . . A simply designed, but permanent treatment hall and laboratory would make much difference to our work". How the doctor supports himself, his assistants and his work is not mentioned; presumably it is by his private practice in his spare time. An example like this appeals to the Indian, and we may look forward to more and more who will follow in his steps. It may be largely in this way that the public health and many other problems of India will be solved.

. . . . .

Much confusion is caused by false positive serological findings in the lepromatous type of leprosy. A positive Wasserman, Kahn or other test in leprosy does not always justify a diagnosis of syphilis. The verification test described by R. L. Kahn and abstracted on page 177 is of importance in this connection.

## SOME BASIC PRINCIPLES IN LEPROSY TREATMENT

E. MUIR

Up to the present day we have had little opportunity of studying *Mycobacterium leprae* outside the human body. It is true that we can make surmises from the analogies of other mycobacteria, such as those of rat leprosy or of the various forms of tuberculosis; but the differences between these latter and human leprosy are almost as striking as the resemblances, and too much must not be based upon such analogies.

### THE TWO FORMS OF LEPROSY

A vast difference exists between the more severe form of leprosy and the slight form which is localised and may often be abortive. What are the factors which create this difference? A mild epidemic of smallpox has been described alongside of a more severe one, and it was proved that this was due to two different strains of virus, the one more virulent than the other. But no one has seriously suggested that the severity of leprosy depends on the mycobacterial strain, and all available evidence is against such a supposition; the difference, whatever it is, lies in the host and not in the invading germ.

The main difference between the severe and the slight case of leprosy depends, at least in the first place, on the activity of tissue cells, especially those known variously as histiocytes, monocytes or macrophages. When the lepra bacillus enters the body its survival depends upon the behaviour of these cells and the degree to which they react locally to its presence, and there may be a wide difference in the degree and nature of this reaction.

There may be intense mytotic division so that the surrounding tissues become infiltrated with epithelioid cells and lymphocyte-like cells packed together in dense nodules, with giant cells of the Langhan's type scattered here and there. In such a case the bacilli are either destroyed or are at least handicapped in their attempt to multiply.

On the other hand there may be only mild reaction; the cellular infiltration is at first slight and the bacilli instead of being destroyed multiply inside the cells and possibly also in the inter-cellular lymph spaces. Wandering cells may convey the bacilli to other sites. The bacilli multiplying inside the cytoplasm give rise to a vacuolated appearance characteristic of the well-known "lepra cell."



In this latter condition not only do the bacilli survive and multiply, but they are able, as it were, to dig themselves in. The way in which that is done may best be described by quoting a translation of the description by Unna <sup>1</sup>.

"We know already a series of obstacles to medical results. The greatest of these is the torpid and very feeble reaction which the bacillus excites round about it in the tissues of the skin and nerves. It does not cause a violent inflammation, serous or purulent, but a simple hypertrophy of connective tissue, of its fibres and some of its cells, tending towards the encapsulation of the bacilli, although the epithelial cells of all kinds remain absolutely passive. In brief the bacillus insinuates itself into the tissue and is retained there, not expelled.

"A second obstacle is the obstruction by the bacilli of all the lymphatic spaces of the tissues in such a way that it is impossible for lively circulation to take place wherever a focus of lepra bacilli has established itself, and thus our remedies can only very slowly gain access. By this obstacle is explained the paradoxical fact that superficial lepromas of the skin are more difficult to heal than those deeper down in the subcutaneous tissue; for in the latter medicaments can penetrate better into the lymphatic system free from the skin.

"A third obstacle, entirely unique, is encountered in the bacillus itself, which produces in its interior a fatty substance; this is why it generally becomes more accessible to oily than to watery fluids. If it shares this difficulty with the tubercle bacillus, it surpasses it by far in local inaccessibility by surrounding itself with 'gloea', that is a mucoid vegetable mass consisting of dead and swollen bacilli, which partly consist of solid fatty substance. This gloea partly separates bacilli from living tissue and partly keeps the foci of bacilli from contact with our remedies.

"The inert vegetable mass, by which leprosy differs unfavourably from tuberculosis, is stained only with great difficulty, and up till now has always been mistaken for the protoplasm of animals cells".

We have described the two extremes of local reaction to the invading bacillus: the one, associated with high resistance and typical of neural leprosy, in which there is intense cellular reaction and in which the bacilli are entirely or almost entirely destroyed; and the other associated with low resistance and typical of lepromatous leprosy in which the cells act sluggishly and the bacilli multiply and dig themselves in. There are of course many stages and minor grades between 'the two.

## TWO OBJECTIVES IN TREATMENT

In any well-established case of leprosy of the lepromatous type, treatment must aim at two objectives: (a) to strengthen and stimulate the cells to act more vigorously, and (b) to break down the triple defence of the bacilli. Care and restraint must be exercised, however, in bringing about the latter, and it must be carried out gradually and only in proportion as the cells have been stimulated and strengthened to deal effectively with the bacilli set free and brought into close contact with them. Otherwise the bacilli are likely to be carried to a distance and form fresh foci and thus extend the disease.

Keeping in mind these two objectives and the proviso that

the bacillary triple defence must be broken down only with care, let us examine the various possible remedies and procedures for the treatment of leprosy.

(1) *Stimulation and strengthening of the cells.* In considering this we should be helped considerably if we knew the reasons underlying the immense difference referred to above between individual patients and the degree of their cellular reaction and resistance to invading bacilli. Is the degree of resistance hereditary? Is it dependent on the degree of infection, especially in early childhood? To what extent is it affected by the condition of endocrine glands such as the suprarenals or thyroid? The writer has seen a slight but long-standing single lesion become negative and disappear under thyroid treatment in a few weeks time.

Of one thing there can be no doubt, that the general health of the patient profoundly affects his resistance to the disease. Deterioration of health not only favours the spread of formerly stationary lesions, but it not infrequently results in tuberculoid lesions degenerating into those of the lepromatous type. On the contrary, it is seldom that a lepromatous case recovers (at least without serious deformity) unless he has continued for a considerable period in uniformly first class health.

The appearance in the neural type of leprosy of what is commonly known as the 'major tuberculoid lesion,' which especially in its more outstanding form is of the nature of a suddenly sensitized minor tuberculoid, is frequently followed by complete healing of the lesion or lesions which resolve and leave only scars. This apparently allergic phenomenon seems to correspond to extreme activation of the local cells, enabling them to destroy the comparatively few bacilli present.

The better known "lepra reaction" in lepromatous leprosy appears to be of a similar nature. The difference is that in place of a few bacilli in the reacting lesions there are myriads which it is beyond the power of the sensitized and activated cells to destroy. In consequence, though many bacilli may be destroyed, the disease tends to spread both locally through the lymph channels and to a distance through the blood. At the same time the toxæmia set up causes a general febrile reaction and tends to depress the general health of the patient still further.

The contrast between the reaction in tuberculoid and that in lepromatous lesions illustrates forcibly the fact already referred to—that breaking down of the triple defence of the bacilli in excess of the power of the cells to deal with the bacilli thus set free is dangerous and harmful.

We know very little of the action of the most widely used remedy in leprosy—chaulmoogra oil and its derivatives. There is no reliable evidence that it acts directly on the bacillus. Does it activate the cells to destroy bacilli? When injected intradermally into skin lesions there is little doubt that it stimulates the cells locally; but what about its more generalised action? These are questions awaiting further investigation.

Local applications to the skin have the effect of stimulating the phagocytic cells and at the same time of freeing the bacilli and bringing them in contact with the cells. Unna in the article referred to above<sup>1</sup> strongly advocates the vigorous use of various types of applications. He recommends iron baths, beginning at a temperature of 30° C and gradually heating; hot douches; friction with oil; ironing the skin with a hot iron, the skin being protected with a layer of flannel. These forms of treatment can be repeated day by day to different parts of the skin surface.

Various kinds of caustics can be used. One of the commonest is the application of a 1 in 3 solution of trichloroacetic acid. Carbon dioxide snow is particularly valuable in elevated nodules. One of the methods recommended by Unna was shaving off the outer parts of the skin, including nodules, with a razor after freezing with ethyl chloride. Cotton swabs soaked in a styptic are then applied and are fastened on with plaster. The next day the same part is again frozen and a caustic is applied. A small part of the nodular surface is thus dealt with daily. In ulcerating nodules, as distinct from trophic ulcers, a useful form of treatment is daily painting with 1 in 3 trichloroacetic acid till the leproma is absorbed and epithelium begins to grow at the edge.

Pressure is another form of local application useful in reducing at least the grosser forms of lesions. It can be applied by means of elastic bands, elastoplast or split bicycle tubes. Unna recommended applying pressure over a dressing of zinc oxide and glycerine.

As mentioned above, intradermal injection of hydnocarpus oil or its preparations forms a useful method of stimulating the local cells apart from any more general effect that the absorbed oil may have.

To get good results a combination or alternation of these forms of local treatment may be used, but passive applications should always be accompanied by active exercises. In the Mkambati Leprosy Institution in South Africa, where unusually good results are obtained, the patients spend a considerable time every morning in bathing, inunction and various applications, and carefully regulated exercises; these are all done communally and

under expert supervision. This is in addition to agricultural work in which they employ themselves for much of the rest of the day.

Active physical exercises have the effect of improving the metabolism and the general health. At the same time they can be used to prevent and remove the deformities of hands, feet and other parts of the body. Removal of dead bone in the feet, hygiene of the nose and the gums and teeth, care of early lesions of the eyes—all these are of the highest importance; failing them, the patient tends to become immobilized and his general resistance deteriorates in consequence.

None of the above recommendations are likely to be of much value unless they are backed by satisfactory nutrition. Not only must the diet be carefully balanced and regulated, but accompanying diseases which interfere with nutrition must be sought out and removed.

2. *Breaking down bacillary defence.* Both the passively received applications and the active exercises mentioned above, if carefully and skilfully regulated, have the effect of strengthening and stimulating the cells and of breaking down the triple defence mechanism of the bacilli so as to bring the latter in contact with the cells judiciously and only in such numbers as they are able to deal with effectively.

It should be mentioned here that we have a drug in our possession which has a specific effect in breaking down the defence mechanism of the bacilli—potassium iodide. This drug has been used from time to time, and as often abandoned on account of its dangerous qualities. In some lepromatous cases even a fraction of a grain has the effect of causing an acute generalised reaction with febrile symptoms, swelling up of leproma of skin, mucous membranes and nerves; though in most cases larger doses are necessary to produce such an effect. The liver, testicles, lymph nodes and any part of the body where masses of bacilli exist are liable to take part in the reaction. Iodide does not appear to have any effect on single bacilli, and large doses may be given without reaction in cases of the neural type with tuberculoid lesions in which, on careful examination, only single bacilli or occasional clumps of two or three are found with difficulty. In apparently neural cases, however, it may cause reaction in affected nerve trunks, presumably because they contain large clumps of bacilli. It would appear that iodide has the effect of dissolving or breaking up the mucoid gloea referred to above, which surrounds the bacilli and helps to isolate them from the surrounding living tissues. How it acts we do not know; but apparently it is not by

direct action. For no reaction results from injection of iodide solution direct into leproma in a strength far in excess of the concentration that can be produced in the tissues by giving large doses by the mouth. Iodide can be used safely in the following two categories: (a) In lepromatous cases with first class physique in whom the bacilli have been reduced to such small numbers that repeated routine examinations of skin and mucosa fail to find them <sup>2, 3</sup>. In such cases the administration of iodide in increasing, carefully regulated, doses breaks up the defence mechanism if the bacilli in residual foci show their presence by causing local nodules or macules, and enables the activated cells to destroy the broken up clumps; (b) In lepromatous cases with good general health, but with a fairly large infection as shown by microscopic examination use minute fractional doses beginning with one-tenth of a grain or less, to be repeated, it may be a week or a month later, only when all signs of reaction from the last dose (including rise in sedimentation rate) have passed away, and raised in amount only when the previous dose fails to produce any appreciable reaction. The essential is that bacilli should not be set free and brought in contact with the living tissues in greater numbers than the cells are able to destroy.

#### SPONTANEOUS HEALING OF LEPROMATOUS CASES

Reference has been made above to relative cellular activity as determining the type of lesion, producing the tuberculoid if activity is high, the lepromatous if activity is low. It has been shown that the former will not infrequently heal up spontaneously, especially after a sudden "flare up" or reaction. There is another condition under which spontaneous resolution takes place. Very advanced lepromatous cases will occasionally heal up without special treatment, though almost always there are marked deformities left. This natural healing process may be speeded up by treatment.

Much has been written in recent years about treatment of leprosy with various dyes such as mercurochrome, methylene blue, trypan blue, fluorescein, &c. The way in which these dyes act when given in repeated doses over a considerable period is illustrated by the following case of advanced lepromatous type and many years standing. The treatment consisted of fluorescein 10 grains a day for seven months, methylene blue 4 grains a day for six months, and trypan blue 4 grains a day for over one month. These were given in the order mentioned, occasionally being discontinued for a few days. The lepromatous areas both cutaneous and subcutaneous showed intense staining and later

began one or more at a time, to become inflamed and to suppurate. After discharging pus full of acid-fast bacilli each area in turn died down, leaving more or less marked scars. The same process occurred in the nose, mouth and throat. From time to time there was severe gastro-intestinal disturbance which suggested that a somewhat similar occurrence was taking place in internal leproma. The patient began to cough up large quantities of pus apparently from the trachea. So severe was this condition on one occasion that his life had to be saved by an emergency tracheotomy; but after he had worn the tube for a few months it was possible to dispense with it. During this period the patient was having almost constant fever. One eye had been destroyed some years previously and the other eye was badly infected and had very little vision; this now became entirely destroyed. Gradually the leproma, which had involved both skin and subcutaneous tissue over large areas of the body, disappeared leaving only scars; fresh inflammatory areas ceased to appear and the patient, though blind and crippled, appeared to have either discharged or absorbed the entire infection within a period of between two and three years. His health recovered, his appetite was good, and he slept well.

I cannot recommend massive treatment with dyes. Former reference has been made to similar results from prolonged treatment with mercurochrome<sup>4</sup>. Smaller doses do not appear to have a curative effect and doses sufficient to cause evacuation of leproma are apt to be extremely dangerous. It would seem as if extremely concentrated dye in leproma acts as an irritant foreign body and results in its own evacuation, the bacilli and the remainder of the leproma sharing in the process. The action of dyes given in small doses over a short period to control lepra reaction is a different matter; used in this way they are safe and of considerable value.

It has been stated by Cannon and his collaborators<sup>5</sup> that a small dose of blocking material stimulates the reticulo-endothelial system, whereas a large one interferes with its function. This might explain the difference between the actions of small and large doses of dyes in leprosy.

I have described the above case in some detail because of the resemblance that this process of sloughing out the disease bears to what sometimes occurs in neural leprosy with severely reacting major tuberculoid lesions. In these also the acute process results in phagocytosing bacilli and sloughing out diseased tissue until the granuloma is entirely absorbed or evacuated. Tuberculoid lesions are as a rule more superficial, the bacilli are few and the internal organs, if affected at all, are involved only to a negligible degree; when they flare up, though some pain and inconvenience

is caused, varying with the extent of the lesions and the severity of the reaction, the condition is not a dangerous one. In the above described lepromatous case the patient would on several occasions have died had it not been for particularly careful medical and nursing attention. The difference between the two conditions lies in (a) the extent of the cutaneous and subcutaneous lesions, (b) the degree of the affection of internal organs, (c) the massiveness of the infection.

We are able with available treatment to control neural leprosy if diagnosis is made in time and the patient is willing to co-operate. What is most required is a means of activating the cells in early lepromatous cases before the disease has progressed to the stage of the patient described above, in which treatment with chaulmoogra and other remedies is seldom successful. Attempts at immunization in lepromatous cases by injection of lepra bacillary emulsion have been found useless; indeed the multiplication of lepra bacilli in the tissues has an inactivating rather than an immunizing effect.

If specific immunization cannot be obtained, is there nothing of the nature of group immunization? In this connection the recent experiments made with diphtheria toxoid are of interest <sup>6</sup>. And even more suggestive are the experiments of Wells and Brooke with the acid fast vole bacillus <sup>7</sup>.

#### SUMMARY.

1. The curative process in leprosy depends on activation of tissue cells, and the breaking down of the triple defence of the bacilli.
2. The condition produced by administration of large doses of dyes in advanced lepromatous cases is compared with that in activated major tuberculoid lesions.
3. What is most required in leprosy treatment is a means of activating the tissue cells in early lepromatous cases.

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## \*LEPROSY CASES IN THE BRITISH ISLES

LEONARD ROGERS, J. HOWARD COOK, and E. MUIR.

At the request of the Medical Committee of the British Empire Leprosy Relief Association a subcommittee consisting of the three of us have carried out an inquiry into the number of leprosy cases seen during the last thirty years by dermatologists in all parts of the country. The following is an analysis of replies received to a circular letter which enclosed forms to cover the required information. These were received from fifty specialists, only fourteen of whom had seen any cases of the disease. The great majority were reported by Dr. J. M. H. MacLeod (to whom we are particularly indebted for his reports of cases) from the St. Giles Homes in Essex and private cases, and by two of us (L.R. and E.M.). All but six cases had been seen in London, doubtless due to so many patients from overseas visiting London for medical advice. The provinces therefore show very few cases, although no doubt there are some regarding which no information has been received. Concealment is likely to be less common than it was two decades ago now that it is generally known that treatment of value is available to those seeking it in good time.

TABLE I.—*Countries in which the Disease was Apparently Acquired (87 Cases)*

Europe: British Isles	4,	Malta	1,	Norway	1,	Russia	1	...	...	7
Asia: India and Burma	35,	Malaya	9,	East Indies	2,	China	3	...	...	49
Africa: S. Africa	5,	S. Rhodesia	1,	Zanzibar	1,	Nigeria	2,	Egypt	1	10
Western Hemisphere: West Indies	5,	British Guiana	4,	Columbia	1,					
Brazil	2	...	...	...	...	...	...	...	...	12
Doubtful: "Abroad"	6,	unrecorded	3	...	...	...	...	...	...	9

*Countries of Origin.* It will be seen from the data in Table I that no fewer than thirty-five of the seventy-eight cases regarding which information is available came from India, including Burma—doubtless owing to the large number of Europeans and to the high incidence of leprosy in that densely populated country. Malaya was next, with nine cases.

*Cases Apparently Contracted in the British Isles.* These number only four in thirty years, all of which were seen from eleven to twenty years ago, and were reported by Dr. J. M. H. MacLeod. In each of these there was prolonged close contact with a highly infective lepromatous case; one was a conjugal infection, and the other three patients were first seen when



respectively 12, 15, and 18 years old, indicating infection at the early susceptible age. On account of lower susceptibility in adults conjugal-leprosy infections are far less common, and we know of several highly infectious patients who have been faithfully nursed by devoted wives for a number of years in this country without transmitting the disease. No case is known to us of infection in the British Isles from a neural or a tuberculoid case, in which leprosy bacilli are very few and are difficult to find.

## CLASSIFICATION OF THE CASES

In Table II the eighty-seven cases (after excluding duplicates returned by more than one spe types and arranged to bring out the number still alive and resident in this country. These are subdivided into the little-infective neural and tuberculoid and the more dangerous lepromatous or cutaneous cases. Those styled "mixed" are included under the more infective lepromatous type, as bacilli may be numerous.

TABLE II.—*Cases of Leprosy seen in Recent Decades by British Dermatologists*

	Lepro- matous and Mixed	Tuber- culoid	Neural	Type Doubt- ful	Totals
Former cases:					
1. Dead ... ..	16	—	7	—	23
2. Repatriated ... ..	6	—	7	—	13
3. Last seen over 10 years ago	3	—	7	1	11
Little-Infective living neural and tuberculoid:					
4. Last seen under 10 years ago	—	—	4	—	4
5. At present under observation	—	1	11	2	14
Infective living lepromatous cases:					
6. At present under observation	18	—	—	—	18
7. Last seen under 10 years ago	4	—	—	—	4
Totals ... ..	47	1	36	3	87

In Table II, lines 1 to 3 show respectively those already dead, those repatriated, and those presumed to be dead or to have passed into a little-infective stage. Those in Category 3 were last heard of from ten to upwards of thirty years ago. The presumption of death after that period is considered justifiable in patients of the lepromatous type, for no fewer than eleven out of thirteen such patients regarding whom information is available had died within one to eight years of being first seen. The whole of the cases in lines 1 to 3 may thus be regarded as no longer of any danger to the community.

Lines 4 and 5 show little-infective neural cases, including one with tuberculoid lesions. They are still alive, or presumed to be alive, because they were last seen less than ten years ago. In view of the fact above recorded, that no such case has been known

to cause infection in this country, they present very little danger to the British community, although in rare instances abroad neural cases have been known to pass into a more infective type.

Lines 6 and 7 each show infective lepromatous cases, those in the former line being known to be alive and in this country, and those in the latter being presumed to be alive as they have been seen within the last ten years. They number eighteen and four respectively, giving a total of twenty-two; they require further consideration.

#### LIVING CONDITIONS OF INFECTIVE LEPROMATOUS CASES

These are shown in Table III, which brings out the following points: Of the twenty-two, five were safely accommodated at the St. Giles Homes; of two more it is reported that one is "strictly segregated" and the other is also isolated at home, "keeping absolutely to himself and taking every precaution against dissemination" of his disease; in two more the disease has reached a quiescent and little infectious stage under treatment; four others were seen at the Hospital for Tropical Diseases, London, and will doubtless have received full instructions regarding the necessary precautions; and a further five are under the highly expert care and treatment of London specialists. In the remaining four the living conditions were not regarded as very satisfactory. The first was reported in 1929 to be residing in a flat with his wife and a young maid during an attack of leptotic fever. The second, a Eurasian subject, was living in the provinces unsegregated. The third was living five years ago with his wife and adult daughter, aged respectively 55 and 35. With these four exceptions the infective cases appear to be well cared for and of little danger to the British community.

TABLE III.—*Conditions of Living of the Infective Lepromatous Cases*

Isolated at the St. Giles Homes in Essex	...	...	...	...	5
Isolated with careful precautions at home	...	...	...	...	2
Reached a quiescent little-infective stage	...	...	...	...	2
Seen at the Tropical Diseases Hospital	...	...	...	...	4
Under expert care and treatment	...	...	...	...	5
Conditions unsatisfactory	...	...	...	...	4

#### CONCLUSIONS

We conclude from the above data that the present position is reassuring in view of the fact that nearly all the cases of the infective type are under expert care. Moreover, the danger of infection under the good hygienic conditions of Great Britain is much diminished by the fact that the great majority of the

repatriated patients are of a social position that permits them to live under favourable sanitary arrangements and to avoid overcrowding. Further, many of them have reached an age when they are unlikely to come into close and prolonged contact with children, who are considered particularly susceptible. We are, however, of the opinion that all infective lepromatous patients who are not in a position to carry out effective home isolation with absolute prohibition of close contact with children should, so far as is possible, be accommodated at the St. Giles Homes. If necessary, Government funds should be made available for effecting this purpose.

## INTRANASAL TREATMENT IN LEPROSY

E. MUIR

Among the most distressing complications of leprosy, and especially of the lepromatous type, are certain conditions of the nasal cavities. These vary from irritating dryness and epistaxis to discharge of crusts and pus, and partial or even total obstruction of air passage. The paranasal sinuses may be infected, adding to the distress of the patient and increasing septic absorption. These conditions are due partly to the lepromatous infiltration, but still more to secondary infection.

In planning treatment three objects must be kept in mind: the prevention of sepsis, the removal of sepsis if it has occurred, and the clearing up of leproma.

1. *The prevention of sepsis.* Septic absorption causes deterioration of the patient's health and exacerbates the leprous condition. It is important therefore to take steps from the outset of leprosy to safeguard nasal hygiene. In doing this it is well to avoid strong antiseptics or drugs which would lower the resistance of the mucous membrane. This is the more important as, whatever treatment is adopted, it may have to be continued regularly for years. Also for this reason it is necessary that the treatment be a simple one which the patient himself can carry out daily. The following simple method is adapted from that recommended by Parkinson\*.

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\*Non-traumatic Ventilation Treatment of the Nose and Sinuses, S. N. Parkinson, *Jl. Laryng. and Otol.* Oct., 1939.

The simple requirements are a small pipette and a bottle of normal saline which the patient can prepare himself by boiling a teaspoonful of salt in a pint of water, and bottling the same. If there is much nasal catarrh or blocking of the entrances to the sinuses, then 0.9 per cent ephedrine hydrochloride can be added.

The patient lies sideways on a couch (or the floor) with a pillow under the lower arm, and the shoulder projecting beyond the pillow. The head is bent towards the lower shoulder so that the vertex rests on the couch. The patient keeps his mouth open and breathes audibly so as to avoid breathing through the nose or swallowing. About a drachm of the solution is pipetted into each nostril and is held there for two minutes. The nares are then occluded with the fingers, the mouth is shut, and strong inspiratory movements are made two or three times so as to form each time powerful negative pressure in the nose. The effect of this is to suck the air out of the sinuses, and, as the entrances to these are submerged, the saline rushes into the sinus each time the suction is relaxed. The saline finds its way out gradually by ciliary vection and thereby washes out and drains these cavities. Ephedrine, if added, removes congestion from the mucous membrane and makes patent the entrances to the sinuses if these are blocked, so that the solution can enter more readily.

Normal saline causes no irritation, and with this form of lavage carried out two or three times a day, septic complications, so apt to occur in leprosy, can be avoided.

2. If severe sepsis *has* occurred and the nose is blocked with pus and crusts, another modification of the same method may be tried. The patient lies in the same position and uses the same solution with or without ephedrine, only it is necessary to retain the saline in the nose for a much longer period and to renew it several times so as to soften the crusts thoroughly; then they can be removed with a saline douche. Until sepsis is cleared up the second part of the process—sucking the solution into the sinuses—should be omitted. In very septic cases sodium sulphate solution may be substituted for normal saline, the solution being 10 per cent or as strong as the patient can bear without irritation. The patient may spend a considerable part of the day, according to tolerance, in carrying out this treatment until sepsis has been removed.

3. The above methods aim at preventing or removing sepsis. For dealing locally with leproma, cauterization in one form or another is best. One of the simplest, requiring no special apparatus, is the application of trichloroacetic acid solution. Before

cauterising the nose (a) remove sepsis if present, and (b) improve the general health. The most suitable patients are L2 or L3 cases with strongly positive nasal smears, who are in good general health and in whom leprosy throughout the body is yielding favourably to treatment or at least not advancing.

The mucous membrane is anaesthetised with 2% novocaine solution, applied as spray and by stuffing cotton wool soaked in the anaesthetic up the nostrils. A ten per cent solution of the acid is carefully applied with a fine brush to the mucous membrane, a speculum and a good light being used to make sure that all the lining is bleached as high as possible. The application may be repeated after two weeks. After anaesthetising, and before each application of acid, remove a small piece of mucous membrane with a sharp pointed instrument and make a smear for examination. Progress can thus be noted.

Careful and timely treatment of the nose should avoid deformity which results from destruction of the septum and contraction of the scars of septic ulcers. Attention to the nose also diminishes to a large extent the danger of the discharge of *M. leprae* and the spread of infection.

## REVIEWS

### **International Journal of Leprosy, Vol. VIII No. 1, Jan-Mar, 1940.**

*Early Lepromin Reaction*, by J. M. M. Fernandez. The writer describes the initial erythematous halo produced within 24 hours after intradermal injections of lepromin (a sterilised suspension of ground up leproma) or lepromin filtrate. He found that this halo reaction corresponded in positivity in 95% of his cases with the late lepromin reaction when readings were taken after three weeks, both being positive in tuberculoid and negative in lepromatous cases. He considers that the immediate reaction is due to soluble, and the later reaction to insoluble, products of *lepra bacilli*, to both of which the patient may or may not be sensitized. Similarly when the filtrable toxins of the Koch bacillus (tuberculin) and the total toxins of the same (suspension of the bacillus killed by heat) are injected intradermally into lepers, the former induces only an early reaction whereas the latter induces both this reaction and a late one consisting of a nodule or papule in the third week.

*Mitsuda's Skin Reaction (Lepromin Test) in Children of Leprous Parents*, by C. B. Lara. One hundred and ten children of ages from one to eighteen months were tested, the tests being repeated twice at four months intervals. Sex had no influence on the reaction. The frequency of positive reactions was in direct proportion to the age. In the retests there was a progressive increase in the proportion of positive reactors which could not wholly be attributed to further ageing.

*Treatment of Lepra Reaction and the Lepromatous Ulcers by Antimony and the Arsphenamides*, by R. C. Germond. The author obtains fall of temperature and clinical improvement with intramuscular injections either of foudadin (0.5 to 3.5 c.c. daily or every second day) or prontosil (5 c.c. daily), the latter giving better results.

"Intra-arterial injection of 5 to 10 c.c. of soluseptasine in septic leprotic ulcers and burns results in their rapid cleansing with corresponding improvement in the general condition. Growth of healthy granulations is promoted and dead tissue is rapidly eliminated. Despite the presumably greater concentration of the drug on the injected side, the effect does not seem to be more pronounced than on the noninjected side. The results obtained by the intramuscular injection of soluseptasine do not seem to be inferior to those obtained by the employment of the intra-arterial route. The hypothesis that acute lepra reaction is due to secondary infection is rendered more plausible by the success of prontosil in the treatment of this condition. Neither foudadin nor the arsphenamides appear to possess the least curative value on leprosy itself. Their virtue lies in their action against the inflammatory element (secondary infection). The treatment of burns and lepromatous ulcers is greatly simplified by chemotherapy. Their rapid cleansing is insured without active local treatment, and elastoplast can be applied at a much earlier date than ordinarily. In neural cases chemotherapy does not dispense with surgical treatment in the presence of necrosed bone. When, on the other hand, the septic condition originates in the tendon sheaths or small articulations, chemotherapy may render surgical measures unnecessary."

*Tuberculoid Changes in Leprosy*, by A. A. Stein. Six cases of leprosy are described and discussed, most of them having tuberculoid lesions. The author remarks:—

"Everything points to the conclusion that the tuberculoid condition is not characteristic of a definite form of the disease."

He explains this statement by saying:—

"It is known that the tissue change is not only typical for tuberculosis, but that it also occurs in syphilis (third stage), fungus infections and other diseases. In the lesions of tuberculosis the proliferative character of the process is very marked, especially in tuberculosis of the skin."

*Basal Metabolism in Leprosy*, by H. Ross. The examination of three hundred and eight cases of leprosy showed that 75.4 per cent had rates within the normal limits. There was no definite correlation between the rates and the various stages of the disease.

*Leprosy Control in Brazil*, by J. B. Barreto. He estimates 35,241 cases in Brazil for which there exist, or are planned for the future, 24,888 beds in 51 institutions.

In an editorial replies to a symposium are summarized and discussed, the question being whether or not a medical student with leprosy should be allowed to continue his course.

' From the discussion on the whole, material support is to be found for the conclusions (a) that a student with the lepromatous form of leprosy should be required to discontinue his medical course, regardless of how advanced in it he may be; (b) that a student with the benign form of the disease might be allowed to continue, provided that he submit to proper medical supervision and that opinion of those with whom he comes in contact is not adverse, but that even in such a case the individual concerned should give serious consideration to the limited promise that the future would hold for him professionally should the disease not be overcome early in its course; (c) that in any case it would be preferable for the individual to give up the burden and strain of student work in order to concentrate his efforts on combating the infection, and (d) that once this is accomplished successfully he might be permitted to resume his course should he then consider it desirable to do so."

### A Serologic Verification Test in the Diagnosis of Latent Syphilis, by R. L. Kahn, *Arch. Derm. and Syph.*, 41, 5 May, 1940.

"A serological test is presented in this article which should help to detect false positive reactions obtained in serodiagnosis of syphilis. The test is based on experimental studies which indicate that serums of non-syphilitic subjects which give positive reactions possess characteristics that can be differentiated from those possessed by serums of syphilitic subjects. The technic of the test is similar to that of the standard Kahn test except that it is carried out at 37° C and at 1° C . . . . Potentialities for the general biologic type of serologic reaction appear to be a frequent occurrence in patients with leprosy who have negative serologic reactions. Of 24 such patients, 50 per cent showed potentialities for this type of reaction. Table 6 summarizes the results obtained when 10 serums from patients with leprosy presumably free from syphilis, which gave negative reactions to the Kahn test, were tested at the different temperatures. It is evident from this table that the precipitation results at 37° C are negative, while those at 1° C are positive.

Case Number*	Standard Kahn Reaction				Precipitation Results					
					37 C.			1 C.		
	Tube 1	Tube 2	Tube 3	Final Result	Tube 1	Tube 2	Tube 3	Tube 1	Tube 2	Tube 3
644	—	—	—	Neg.—	—	—	—	0†	+++	++++
694	—	—	±‡	Neg.—	—	—	—	0	++++	++++
755	—	—	—	Neg.—	—	—	—	+++	+++	++++
860	—	±	+‡	Neg.—	—	+	+	0	++++	++++
918	—	—	—	Neg.—	—	—	—	++	+++	++
963	—	—	—	Neg.—	—	—	—	++	+++	++++
994	—	—	—	Neg.—	—	—	—	+++	++++	++++
1019	—	—	+‡	Neg.—	—	—	—	+++	++++	++++
1058	—	—	—	Neg.—	—	—	—	+++	+++	++
1084	—	—	±‡	Neg.—	—	—	—	+++	+++	+++

\*These case numbers accompanied the specimens submitted for examination by the United States Marine Hospital, Carville, La.

†0=insufficient serum.

‡These precipitation readings are below the reporting scale of "doubtful."

"The verification test is intended to be used as a supplementary procedure to diagnostic serologic tests when such tests are doubtful, weakly, temporary or fluctuating positive reactions in cases of asymptomatic syphilis."

**Leprosy in India, XII-2, Apr. 1940.**

*An Epidemiological Study of Leprosy with Special Reference to the Leprosy Survey in Santalpur (North Bengal)*, by J. Lowe and I. Santra. This paper is one of considerable importance and is summarised as follows:—

“ The clinical and epidemiological variations of leprosy seen in different parts of the world are briefly discussed, and it is considered that the chief factor concerned in the production of these differences is that of race. The importance of age-distribution and type-distribution as indications of the seriousness of leprosy in a community is strongly emphasised. The hypothesis is made that when leprosy is increasing, the proportion of lepromatous cases is usually high, the incidence in children is also relatively high, and in old people low; whereas when leprosy is decreasing the proportion of lepromatous cases falls, the incidence in children is relatively low, and in old people relatively high.

“ The details of a survey of 3,600 Santals in North Bengal are given. The incidence was high (7.4%) but the proportion of lepromatous cases was very low (4.1%), while the study of age-distribution showed a relatively low incidence in children and a high incidence in adults and old people. The forms of leprosy were exceedingly mild, and figures of type-distribution in the different age-groups indicated that very few of the mild cases later became serious.

“ It is considered that the above findings justify the opinion that in Santalpur, in spite of very high incidence, leprosy does not constitute an important health problem. The desirability of further studies along similar lines is emphasised.”

[There can be no doubt of the importance of *race* as determining both the predominant type of leprosy and the seriousness of the disease as a health problem in any endemic area. But it is important to consider to what extent racial susceptibility is internal and physiological and to what extent it is environmental and dependent on social and economic factors.—Editor.]

*Preservative Effect of Creosote on Hydnocarpus Oil*, by N. K. De. This effect was determined by changes in the acid value, peroxide value, and specific rotation. The results of various controlled experiments suggest that creosote may act as an anti-oxidant when hydnocarpus oil with a comparatively high peroxide value is stored under conditions which accelerate oxidation, i.e., when it is kept exposed to air, light and foreign impurities. Obtaining a supply of really good oil and its proper storage are, however, much more important than the addition of creosote to it.

**Leprosy Situation in War-Torn China**, by T. C. Wu. *The Leper Quarterly*, Dec. 1939.

“ The Sino-Japanese war has wrought havoc with every phase of the life of the nation, politically, economically, socially and what not. That it also has an adverse effect on the leprosy situation is quite understandable. The fact that eight of the most heavily affected provinces with approximately three-fourths of the best



organized leprosaria and leprosy clinics in the country have fallen into Japanese hands, gives us a clear idea as to the effect upon the general condition of leprosy and its relief work. It is quite within our imagination that this devastating war has not only deteriorated the organised work of leprosy, but also caused the shift of the leper population from the city to the country and from one place to another. When one city was threatened by invasion the lepers would naturally flee for their lives to places of safety, and they would very often travel by foot hundreds of miles seeking for a refuge, their destination being invariably a leprosarium. We have a striking example in the behaviour of some patients in the Shanghai Leprosarium. Shortly after the outbreak of hostilities the majority of our patients left for home and elsewhere, and ten of them were so adventurous that they went, almost penniless, as far as Nanchang, Kiangse, Sinhwa and Hunan, where two of our affiliated leprosaria were located. But when these two cities became too hot for them with war rumours and atmosphere, they hastened back to Shanghai under unimaginable difficulties and hardships!

“According to the estimate of some authorities on leprosy, there are today no less than 5,000,000 people in the world suffering from the dread disease of leprosy. Of this number China contributes at least 1,000,000 scattered all over the country. Generally speaking, leprosy is more prevalent and virulent in the South and South-west than other parts of the country due to hot climate and mode of living.

‘But leprosy is a strange and mysterious disease. While climate is an important factor, it cannot be regarded as a criterion, for such northern provinces as Shantung and Kansu are as badly infected with leprosy as the southern provinces. Nor is the economic standard of people a deciding factor. Take, for instance, Shansi and Honan, where most people are living in mud houses and under most insanitary conditions. Yet these two provinces are practically free from leprosy. Tibet and Szechwan furnish another example. In spite of their cold climate, they are not immune from the dread disease.’

**Self-healing of Reacting Tuberculoids in Infants**, by N. S. Campos. *Revista Brasileira de Leprologia*, Vol. VII, No. 4, Dec. 1939.

The author tells of two cases of leprosy in infants of 20 and 30 months respectively. He classifies them as reacting tuberculoid cases. They underwent spontaneous cure, no treatment having been used. The author concludes that there are certain forms of leprosy in infancy which, in the absence of superinfection, produce

lesions of tuberculoid nature and heal spontaneously with cicatrization.

**Surgical Correction of Nasal Deformities Caused by Leprosy**, by Antonio Prudente. *La Presse Medicale*, February 6, 1940.

The author recounts the various nasal deformities in leprosy and their causation by leproma formation and its contraction, and by destruction of the nasal cartilages, especially that of the septum. He uses two types of operation for their correction: (1) simple inclusion of resistant material with the object of replacing the cartilagenous nasal framework; (2) a skin transplantation to reconstitute the skin itself. The first operation depends upon the nature of the cartilagenous destruction. In simple saddle-back deformity due to alterations in the cartilage similar to those in the congenital or syphilitic deformity it is rare to have any respiratory trouble. Operative correction is done with the object of improving the appearance. He introduces an inert substance which is often condemned by French surgeons as having the disadvantages of a foreign body. He avoids the use of cartilagenous grafts as these are apt, in a leper, to become absorbed. He does not believe in using paraffin wax as in the damaged skin of a leper it does not give good results. He considers ivory the ideal material for inclusion. Not only is it tolerated by the patient, but also it can be moulded to the desired shape. It resists absorption, a fact which is so necessary in Hansen's disease. If the ivory is shaped exactly to the nasal depression it can easily be fixed in position. It must be smaller than the seat in which it is to be placed; the difference should be at least 3 or 4 mm. in each diameter. When there is a falling in of the point of the nose it is necessary to make a new inclusion at the level of the septum. In these cases the ivory does not give such good results, as the skin lacks elasticity. In the severer cases where the skin is destroyed the author takes a flap of skin from the forehead. The article is well illustrated and shows apparently satisfactory results in the cases described.

### **Ascites in Leprosy.**

A letter in the *British Medical Journal*, May 18, 1940, describes a technique used by Dr. G. A. Rylie for treatment of ascites due to cirrhosis of the liver in leprosy.

"If the intra-abdominal fluid tension is high, enough fluid is removed to take off any considerable strain. Then a saturated solution of ammonium chloride is injected into the peritoneal cavity sufficient to make approximately a 1 per cent solution of ammonium chloride. In most cases this can be done with a 20 c.cm. syringe. The plunger is drawn back and pushed forward several times to ensure a rapid diffusion of the salt.

Care must be taken to avoid leaving ammonium chloride along the needle track, otherwise a sinus may ensue. This injection is repeated every second day, and with the fourth injection 2 c.cm. salyrgan is given intravenously. The patient is then rested for two to four days, according to his condition. The course is then repeated, up to six times if necessary, though usually three or four courses are sufficient."

[Whether leprosy ever causes cirrhosis is questionable, but it is a not uncommon condition among lepers in tropical countries.—Editor.]

## REPORTS

### **\*Social Problems connected with the Internment of Lepers**

In Brazil, as in other countries the too strict enforcement of the regulations for the internment of lepers produces a considerable amount of hardship and, perhaps, unnecessary suffering among the patients. The enforced isolation sometimes becomes intolerable, and to gain relief from it, a certain number escape from the institutions. In Brazil fifty per cent of such escapes are attributed to the urge of family affections between husbands and wives, and between parents and children. Many, probably most, lepers become reconciled to the separation and recognise the necessity for it.

In one of the Brazilian leper colonies there lives a patient, a distinguished scholar of high scientific attainments, who, because of his disease, had to abandon the practice of his profession. Because of the intractability of his case to treatment he voluntarily entered the colony, that he might not be a danger to the community. His devoted wife, although perfectly healthy, refused to leave him in his misfortune, and the two live happily together in the leper home. The hardest part of their lot has been the separation from their family. As soon as the professor knew the nature of his disease, he sent his four children away to live with relatives. As a precaution they were isolated later for some years in a children's preventive home, and, when proved to be free of disease, were taken charge of by their grand-parents who were to bring them up.

The dread of social ostracism of leper families is very real. One can imagine the feelings of a doctor, when it was found that

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\*Arquivos de Saúde Pública VII. 9, Dec. 1939 (Abstracted and translated by J. W. Lindsay).

his younger brother of twelve had begun to show positive signs of the disease, and had to be interned in the leper children's home. Not understanding very well the question of leprosy this doctor even went to the length of begging the Medical Director of the establishment to relieve the unfortunate boy from his awful fate by euthenasia. The Director understood the case, and could give good hopes of saving the young patient, and the doctor brother could face the world again.

A beautiful young lady of good family and education, and engaged to be married, became almost hopelessly embittered with life, when she was pronounced leprous. Her religious convictions, however, forbade the thoughts of suicide, which might have been contemplated in such circumstances, and she bravely faced the future, until the time when she learned the good news that science had provided a hopeful remedy for her relief and that she would not have to be isolated.

There was the case of a young lady in whom the disease manifested itself for the first time during her honeymoon and she had to leave her bridegroom just at the time when both were enjoying the happiest days of their life and when there seemed to be opening up before them a future of smiling sunshine and bliss. One can imagine their tragedy of heartbreak at the prospect of having to be permanently separated, but medical science dispelled such fears with a reasonable hope of permanent cure without internment.

The worries of business make strict isolation very irksome to well-to-do people. There is the case of the leper proprietor of a large property which he had been prevented from visiting for twenty years, but which he must now visit, as the sale of the estate required his presence on the spot. Could this infective leper afford to leave his business to be attended to by other people whom he could not trust? Could he be allowed to take the long journey, during which he might be in contact with many healthy people on railways and in hotels, to whom he might convey infection? He did not go.

Careful diagnosis of the disease often helps to relieve the hardships of too strict isolation, as in another such case, that of a leper whose presence in another place was absolutely essential before his rights to an inheritance could be recognised. He was a patient of the purely nerve non-bacilliferous type, and could without danger be allowed to take the journey. He went.

But again the urge may be too insistent, and may prevail. A big coffee planter, who had been interned as an infective leper, asked permission to go to his plantation to arrange for the coffee

harvest and for the sale of his crop. This would entail weeks of more or less close contact with the workers of his plantation. His request was denied. His anxiety for his business prevailed. He made his escape from the leper home, and only returned after having completed all his necessary work on the plantation.

Although such cases are reported from all leper lands, these are given from the Brazilian report as indicating how similar leper conditions are in different countries.

**\*Dichpali Leper Settlement Farm** by E. L. BEVAN.

In the practice of farming, tillage and manuring are the main activities. The truth of this was recognised in the days of the Roman Empire, and it is exemplified in a striking manner to-day in China, where some of the highest crop yields in the world are obtained by means of diligent manual labour. In our work in Dichpali we, too, place emphasis upon these operations, and in a difficult season, such as the one through which we have just passed, we have seen again proof of the soundness of that policy. After tillage and manuring, the weather conditions are probably the main factor controlling crop production. During the past year those conditions have alternately helped and hindered our work. From the time of writing our last report until the break of the Monsoon in June there was no rain of any significance. The soil became baked so hard that on the farm the usual after-harvest cultivation could not be carried out; in the gardens the soil was a little more tractable and it was possible to maintain the land in somewhat better condition. The summer months were unusually hot, and as there were no rainy intervals our wells showed again their inadequacy to provide the necessary water for hot season crops. The South-west Monsoon broke in June and up till the end of September yielded approximately half the normal amount of rain for the period. Following on an eight months' drought this was quite inadequate, and our rice crop had to be grown throughout the season as dry crop as there was no water to flood it; the yield of vegetables for those months was barely half that of the previous year. If the rains had not fallen at unusually suitable times, e.g., for sowing and for weeding, etc., the crops could not have grown as they did, for ours were out of all proportion to the rainfall recorded. To this must be added the fact that tillage and manuring bring their own reward, and our crops did better than those of our neighbours partly because we have paid more attention

to those matters than it is customary to do in the villages. Some of the long-lost rains appeared in October and in one night irrigation tanks and wells were filled. This rain was too late to benefit the rice crop to any extent but it has done good in other ways, and has assured us of water supplies for all kinds of crops during the coming months.

*Development.* The past year has seen considerable development on the farm and in the gardens. Two new dry fields have been made near the farmstead and have carried crops this year. The new farm well has been constructed and a persian wheel fitted. This well proved of great help in irrigating the rice fields during the shortage of rain from June to September. On the completion of the well the road boundary along the Nirmal Road was closed, partly by extending the old wall and partly by the erection of a barbed wire fence. In the main garden a good deal of rock has been removed by digging and blasting, and a new water cistern for irrigation has been built. In the boys' garden the bullock water lift has been reconstructed. A drinking trough was built at the farm, and both there and in the main garden water cisterns for the compost pits have been provided. These improvements will enable us to carry out our work more easily and efficiently; the combination of bullock water lifts with suitable cisterns and iron pipes for water. A temporary well for the fruit orchard was dug. The provision of this well was long overdue; for lack of it the orchard had never been cultivated efficiently. A well being provided we have pruned the trees, cultivated the ground, and filled in the gaps caused by trees drying up, and we hope to have better crops of fruit than has been possible up till now.

*Tillage and Manuring.* Of our tillage work it is not necessary to write. Diligent use throughout the year of plough and crowbar, of hand hoe and bullock hoe, each in its appropriate season, is our aim, and as far as weather conditions permit we are tilling in one way and another all the year round. It is in this work that the patients are able to help both themselves and ourselves—in renewing their own physical well-being and in keeping the soil soft and mellow.

Of manuring we may repeat what we said last year, namely, that whatever we do it is inadequate to supply our needs. The three compost factories at the farm, the main garden, and the boys' garden, have been working all the year round, the patients gathering huge quantities of weeds, grass, leaves, and all kinds of vegetable rubbish both within and without the institution grounds. Diminished supplies of dung (due to the absence of the dairyherd) caused a reduction in quality and quantity of the compost made at the farm. To rectify the deficiency we hired during the summer herds both of cattle, and of sheep and goats, which were tethered on the fields for several weeks. We continued our use of leguminous crops for fodder and for fertilising the soil. Sunnhemp showed again its unsuitability for our soil, and we propose to try Dhaincha for a green manure crop next year provided that we can procure sufficient supplies of seed. The cold season black pulse crop also gave only a small yield owing to the lack of rain in October. Owing to adverse weather and soil conditions our legume-fertilising scheme has not been very successful this past year, but we believe still that it is a right method to adopt, and we shall continue our work next year.

*Crops.* As yet no figures showing the yield of our crops have appeared in this Annual Report. There are several reasons for that intentional omission, one of them being that the report is prepared at a time when the present year's crops have not been threshed and weighed, whilst those of the previous year have passed out of mind for they have been disposed of during the intervening months. We make very few cash sales of produce, hence the yield and return of crops does not figure so largely with us as it does in the case of a *ryot*. We aim at growing what we require for food and fodder in the Institution—all the fruit, vegetables, rice and

millet being handed over to the hospital for distribution to the patients, whilst the straw, grass, pulse crops, etc., are utilised for feeding the cattle. The following figures (which are not quite complete) will serve to give some idea of the present yield of our chief crops for the year 1938 (June) to 1939 (May).

FOOD CROPS.	Fruit and Vegetables.	79,084 lbs.	(35 tons)
	Paddy.	24,810 lbs.	(11 tons)
	Millet—Nil on account of excessive rain.		
FODDER CROPS.	Paddy Straw	66 cart loads.	
	Millet Straw	5 cart loads.	
	Guinea Grass (green)	11,807 lbs.	(5 tons)
	Green Millet	23,137 lbs.	(10 tons)
	Field Beans (green)	10,312 lbs.	(4½ tons)
	Black Pulse (grain)	1,054 lbs.	
COMMERCIAL CROPS.	Sugar Cane. Sold to Factory	1,480 maunds.	(72 tons)
	Sold or used as seeds	541 maunds.	

The farm land produces only one crop per year except for a small area of leguminous catch crops which provide fodder and a little grain, these catch crops being sown after the rice crop has been harvested. With the provision of the new well we hope to increase considerably this area of catch crops and so secure a larger return from the land. In the gardens whilst it would be possible to raise two or even three crops per year deficiency of water and excessive heat render it impracticable to grow much besides indigenous greens during the greater part of the summer. There is an almost unlimited demand for such crops, but at present we are unable to supply more than a small portion of what is required for the patients.

As an experimental measure we filled two disused lime kilns with green jungle grass in order to see whether it will make satisfactory silage or not. Should it prove successful we could develop the work so as to procure a regular supply of silage from the waste grasses that grow alongside the roads, etc., in the compound, and which at present yield only rough grazing.

*Education.* An instruction course for school teachers was held in April when nineteen teachers were enrolled; they spent four days attending lectures and demonstrations in elementary horticulture. In January a party of *ryots* from several different villages spent a day seeing and hearing matters that were mostly new to them, and yet all of them possible of adoption by themselves. Throughout the year individual cultivators have been to see our work; some of them who live near by are adopting our methods in their own fields, with profit to themselves. We try to demonstrate how usage commonly found in the villages may be improved, growing the ordinary crops as illustrations of our methods. A teachers' class for the farm and garden supervisors has been held weekly as far as possible, and a new departure in the form of an elementary class for a group of older boys (patients) has been started. Should this new class prove worth while it could be extended to include a larger number of interested patients.

Though it is not fitting for us to commend our own work we close this year and pass on to the coming year with renewed confidence in our methods, for we have seen them succeed in what has been a difficult year for cultivators. Whilst it is true that we have not had full crops yet we have had better crops than we thought would be possible.

## NEWS NOTES

### **Japan to wipe out Leprosy. Thirty Year Objective.**

There will be no more leprosy in Japan thirty years from now, it is believed by the Japanese Ministry of Public Welfare, after the materialization of the five-year plan providing accommodation for ten thousand lepers in asylums.

The number of lepers in Japan is estimated at fifteen thousand. The Government has hitherto opened up or has improved five asylums. An additional asylum will be opened this year in accordance with the five-year plan. The law for the prevention of the spread of leprosy has been changed so that patients hereafter are to be sterilized. It is expected that the extermination of the malady will be hastened by this measure.

### **Leprosy in Jamaica.**

The *Daily Gleaner* of Jamaica of 28th March, 1940, reports the following speech by the Governor of the island:—

“ I think it was in September, 1938, soon after assuming office here, that I visited the Lepers' Home in Spanish Town. I was deeply shocked by what I saw and determined to try and do something for the unfortunate inmates. I will not weary you with the details. The Lepers' Home is and for long has been a blot on the administration of this Colony. The relevant Government papers taught me that the question had been anxiously considered without any result for years. Possible alternative sites had been examined and rejected for one reason or another. One of the main difficulties about removal to another site has always been the fierce opposition of populated areas to having it brought near them, and the impossibility of finding an alternative site which was both isolated and not entirely barren. I discussed the matter many times with Mr. Crayford, the T. C. H. representative, who was driven finally to the conclusions, which I also reached, that we should have to make the best of its present location. Three essentials remained, (1) more land, (2) complete rebuilding and (3) re-planning and proper management. The first was settled by the generosity of the United Fruit Company, which gave 20 adjacent acres for the purpose. The second was largely provided for by the existence of a provisional allocation of £12,000 in the Loan. We were then left with the third difficulty that of effective and experienced and continuous management. Mr. Crayford would have liked to be given charge himself, though he admitted that



this was not a solution and that neither continuity nor efficiency could be guaranteed. What was wanted was an organisation rather than an individual. He reached independently the same conclusion as myself, that the only hope of attaining what we wanted was to interest one of the religious bodies who had experience of such work, as a work of mercy on a non-sectarian basis. The field of search was very narrow. As you have been informed by the Hon. Member for St. Catherines various Christian bodies have been informally approached but without result during the past few years.

“ It was here that my own personal experience came in. Leprosy and its care is a subject of which I have had a wide experience, and the importance of the subject will perhaps excuse a brief sketch of that experience and the conclusions to be drawn from it, which are very relevant to this discussion. My first experience was in the Malay States and the Straits Settlements—in the Far East. There we had originally two leper islands where lepers were sent by Government and housed largely in huts of native construction. They had proved very difficult to administer. The lepers were miserable and suitable supervision was very hard to obtain. The Federated Malay States Government then decided to build a model Leper Settlement within ten miles of Kuala Lumpur the capital town of the Federated Malay States. Large sums of money were spent on it and in the end it represented everything that money could buy. But it was not a complete success. It had too much of the atmosphere of a prison, and the difficulties of proper subordinate supervision were immense. Believe me, gentlemen, it requires something more than good housing and the normal performance of duty which a Government salary can buy to make a Leper Home other than a dismal lazaretto.

“ My next experience was in Borneo, where we kept our lepers again on an island, in native huts on the sea shore. There too we could not obtain proper supervision. Money alone cannot buy continuous devotion in such distressing surroundings.

‘ The settlement was, despite visits from kindly persons in addition to the doctor, a place of unhappy exile. I ask you to follow me across the world to West Africa. In my travels up-country in the Gambia I found lepers in every village, sharing the same huts and using the same cooking-pots and spreading contagion. We organised one or two leper village camps and succeeded in a certain amount of voluntary segregation under regular visits from a doctor, but of course there was no proper supervision, and attendants could not be induced to take on the job. These camps did something to prevent the indiscriminate spreading of contagion and helped to arrest the disease in the sufferers, but I cannot claim

that they represented much hope of cure or were really more than a beginning. We aimed at educating the people to regard leprosy as an avoidable thing, to be controlled by segregation, and ultimately to be cured by the institution of a properly equipped Home.

At this stage I must take you across the world again to the Pacific. I found there that one of the Fiji Islands had been set aside as a Leper Home, a small island of great beauty a few hours sail from Suva, the capital town of Fiji. This leper settlement receives lepers from all the Pacific Islands under the jurisdiction of Fiji, New Zealand and Australia. It is managed by the Government of Fiji, with a resident Medical Officer and an administration staff of Marist Sisters. The expense is borne on a *per capita* basis by the administrations concerned and it is run as a Government institution on an entirely non-sectarian basis.

' All denominations of Christianity are represented amongst those inmates and are visited by their respective pastors, and they have their separate religious services. But quite 75 per cent of these inmates are Wesleyan Methodists, since that denomination is the strongest in that part of the Pacific, and most Fijians belong to the Methodist Church. At one time the lay Superintendent was a Scottish Presbyterian.

" I wish you could see those wards, gentlemen, and compare them with the squalid misery of our own Home or even, if that comparison is not fair, with the soulless material efficiency of the Malayan home. Clean, airy, beautifully-kept wards, where the advanced cases are not mixed with those in the early stages—separate children's wards—a dozen or so little cots in each, with the centre tables piled high with dolls and teddy-bears, and toys of all descriptions sent in lavish abundance by the Anglicans of New Zealand and by the Methodists of Fiji—sent to the Sisters to help them with their little charges.

" Gentlemen, it is the birth-right of every child to have a little light and a little laughter. Will you deny it to the sick children of your own race? I am sure you will not do this thing. There is no childish laughter in the Spanish Town Home, nor is there anything but adult depression. The word Home is a mockery. At Makogai in the Pacific, the Sisters radiate their own atmosphere of loving care, of cheerfulness, and of hope. Yes, gentlemen—hope. Because every year the Director of Medical Services holds a Medical Board with the Resident Medical Officer, and half a dozen or perhaps a dozen patients are discharged as cured and restored to their friends.

" And I may say here, gentlemen, lest their cheerful smiling

efficiency and their life-long devotion should obscure the nobility of their work, it has been found that only an exceptional doctor can stand the strain of service on the Leper Island for more than two or three years. He is then changed. Does it matter that the Sisters are strengthened in giving their lives, for it is no less that they give, because of the faith that is in them? Did it matter what were the religious convictions of the good Samaritan?

"You will remember that it was said: 'Greater love hath no man than this, that he should give his life for a friend.' You may also recollect that in Kipling's story the little Indian boy Kim was called 'little friend of all the world.' Gentlemen, that is what the Marist Sisters are—little friends of all the world.

"The Government aims at stamping out leprosy in this island. I have medical opinion solidly behind me in saying that there is no reason why in a period of two or three generations we should not free Jamaica from this scourge. It is perfectly possible in so small an area.

"But an essential condition is a model Leper Home where patients would go willingly in the confident expectation of loving care and reasonable comfort and, for those in the early stages, the hope of cure."

**Leprosy in Roumania.** E. Szekely carried out an enquiry in this subject and submitted a thesis in 1938. There are in Roumania about 4,000 lepers and this number is tending to increase, especially in certain regions. This process is in progress chiefly in the frontiers of Bessarabia. The devotees of a religious sect who mutilate themselves so as to become eunuchs after the birth of the first male child, are the chief contributors to this malady; the other inhabitants are also attacked but in a less proportion. In Roumania there is no special legislation enforcing the isolation of lepers, as there is for example in Greece on an island in the Archipelago. However, they require the patients to live together at Tichilesti at the side of the Danube. Of the two leprosia, that at Largeance in Bessarabia is a kind of village with 250 patients working in the fields; among them there is a certain number of leper couples. It was founded in 1916, at which time leprosy began to spread considerably to the south of Bessarabia. A leprosy specialist directs the medical service. The leprosarium at Tichilesti, which was destroyed in the last war, is being reconstructed; it is situated in a very favourable climate.

The **Rhodesia Herald** reports: "An interesting tree has been found on a plot at Highlands, and it is probable there are no others

south of the Zambesi. The tree is well known to the natives who come from considerable distances to secure latex from it, believing that it is a cure for leprosy. In appearance the tree resembles a frangipani, but is really a *symadenium*, a close relative of the *euphorbia*. Some years ago the late Mr. Swinnerton reported seeing a similar tree at Mount Selinda, but efforts to discover the tree have failed. It has, however, been reported in the Zambesi Valley. It is probable that the Salisbury specimen was brought down by natives. Almost any part of the tree will grow when planted, and the branches have considerable vitality."

[The milk-like juice of *euphorbia* and other similar trees has a strong caustic action and is used to cauterize tuberculoid leprides with a certain amount of success.—Editor.]

### **The Anti-Leprosy Campaign in Orissa, by Isaac Santra.**

I am writing this note on the 20th May, 1939, sitting in a room where a European doctor sat exactly ten years back. This man sat and meditated how best the problem of leprosy could be tackled in Orissa, a place where the incidence of leprosy is highest in India. There were altogether twelve doctors under his supervision. Long before the sunrise when the men were in bed and the village brides went to the village tank, the party would be seen to go out to find out how many lepers the surrounding villages had, how they got the disease and what could be done for them. They must reach the village before the men left for the fields. By the time they came back the cattle would be seen resting under the shade of trees chewing the cud.

This labour bore fruit after ten years. From the beginning of 1939 the Orissa Government has given effect to an anti-leprosy scheme which in my opinion is the best in India. Most of the other ten provinces of India have made enquiries regarding this scheme. For the benefit of readers I wish to describe the scheme.

In the year 1936 Orissa was constituted as a separate province. Its population is 80 millions and the number of estimated lepers is 60,000, of which 15,000 are supposed to be infectious. It is the poorest province in India. The people's mainstay is agriculture. Many go to the tea gardens, coal mines and factories for labour. Generally the trade is in the hands of merchants from other provinces, yet the Orissa Government spends about Rs. 40,000 annually on an anti-leprosy scheme.

The scheme, in a few words, is to register lepers within a radius of five miles from existing dispensaries, provide for their treatment, and isolate infectious cases. This is done through the Orissa Branch of the British Empire Leprosy Relief Association. Each

district of the province has a district leprosy council affiliated to the Provincial Association. There are a district leprosy officer and three compounders for each district. The medical officers of the dispensaries give treatment to the out-patients at a fixed hour on fixed days, generally two days in the week. Each clinic has a clinic committee and village committees whose main work is to persuade infectious cases to live away from the village. It was a custom in India to ask lepers to live outside the village or spend the rest of their lives within the premises of a temple. The present attempt is to make it more humanitarian. Huts are built, enough land is given for cultivation purposes, and attempts made to make their lives comfortable. To supervise all these works spread over the districts of the province there is a provincial leprosy officer. This officer and myself will be going round all the districts of the province checking survey figures, watching the treatment of clinics, inspecting proposed village isolation centres and colonies, and we hope to benefit the campaign by our advice. The expense, including staff's pay, literature, medicines, isolation huts, food and clothing for isolated cases, is estimated at £452 a year.

According to the estimation, by the end of five years (the plan has been sanctioned for five years) leprosy clinics will have been attached to all the dispensaries, each district will have at least four isolation centres, and a large colony and a central laboratory for leprosy work will have been established. Sufficient data will have been collected to impress the Governments that continuation of the work is necessary.

I have often tried to guess what ideas were passing through the European doctor's mind when he sat in this room. But I am sure he will be pleased that his labour has borne fruit. Orissa will ever remain grateful to him.

The **Field** shows a picture of Chaulmoogra trees (probably *Hydnocarpus wightiana*) at the Government Experimental Station near Rabaul, in the Mandated Territory of New Guinea. These trees are gradually being introduced all over the tropics.

**The Federation of Leprosy Relief Associations.** This organisation, founded in Brazil in 1932, had then only six groups of voluntary auxiliary helpers. Today the Federation has 78 auxiliary societies distributed throughout the country, lending invaluable help to the Government Leprosy **Board**. Their work is thus described. "The father of the family had some spots on

his face. His ears were reddish and somewhat swollen. His wife remonstrated with him sometimes because he would not see a doctor. 'Oh,' he would reply, 'this is nothing. There are plenty of folks with spots on their faces.' This kind of talk often took place. Then one day he felt really ill. He went to the Health centre. The skin specialist diagnosed him as a leper that required hospital treatment. 'But who will care for my family,' the man protested. 'Don't you worry about that, my friend,' said the doctor. 'Here in the town we have our Leprosy Relief Association. Your wife will be cared for, your family will be sent to the children's home, where they will be kept, and given all their education. Our Association will provide for all their needs and for their mother. She can visit you in hospital, and can always be sure of her children's happiness.'

"Five years passed; the children, well cared for in healthy surroundings, had been saved from the disease and were better equipped for life than if they had remained in their father's home, while he himself was discharged 'cured' sufficiently to warrant a return to the happiness of his home.'

**Elephantiasis Graecorum.** The name of *leprosy* arose out of a good deal of confusion. According to Liveing's Goulstonian Lecture in 1873, leprosy was not known in Greece in the time of Hippocrates, who described psoriasis as *lepra* (λεπρά). By the time of Aretaeus true leprosy had come to South East Europe, and he described its signs accurately under the term 'leontiasis.' Lecretius and Celsus, the Latin writers, use the term *elephantiasis* or *leontiasis graecorum* for this disease described by the Greeks; and they used the term *elephantiasis arabum* for the filarial disease we now call elephantiasis.

The Hebrew word *Zaarath* was a generic term for various scaly skin diseases which are mentioned in the Bible. It has wrongly been translated by the specific term 'leprosy.'

Constantine Africanus, in the 11th century A.D., in accordance with the theory of the four juices of the body, divided leprosy into four types: *elephantiasis*, *leonina*, *alopecia*, *tyria*; but he used *lepra* as the general term.

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