LEPROSY REVIEW.

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Contents.

The Association does not accept responsibility for views expressed by the writers. Communications may be sent to the Editor, at 29, Dorset Square, London, N.W.1.

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Editorial.

WITH the consent and approval of the Executive Committee of the Association, the title LEPROSY NOTES has been changed to LEPROSY REVIEW, and this publication is issued in a somewhat different form. The aim remains the same, *i.e.*, it is an attempt to meet the need for a quarterly periodical giving interesting and practical details to workers, especially to those who have made no attempt to specialise exclusively in the field of leprosy. It is not intended to be a scientific or technical journal in the usual sense of those terms. The appreciative letters we have received from time to time encourage the belief that our aim in supplying a useful and practical magazine is being fulfilled to a large extent, and we feel certain that the altered form of this publication will meet with approval.

While the REVIEW, and all other literature will be sent to workers in the British Empire, and to missionaries, also to those already on our mailing list, free of charge, we shall be grateful to any readers who feel they would like to help by contributing towards the naturally heavy expenditure that this side of the work entails.

We hope to be able to give still greater assistance to those engaged in the fight against an age-long scourge. The control and ultimate elimination of leprosy from the Empire is the aim of The British Empire Leprosy Relief Association, and we trust that each year will mark a definite step towards the attainment of this great ideal.

We wish our readers a prosperous and Happy New Year, and every success in their work.

Prognosis in Leprosy.

R. G. COCHRANE.

ONE so often hears varying and contradictory statements with regard to the ultimate outlook in treatment, that it may be of value to sum up the present position. The prognosis or ultimate end of leprosy has to be viewed from a slightly different standpoint than is the case in many other diseases. The disfigurement that the disease produces in the later stages, the deformities that so often result, and the social stigma attached to the leper, all make it of utmost importance that something more than a mere eradication of the disease should be the aim. If the " cure " results in mutiliation and physical deformity, the position of the patient socially is in no way changed, and he cannot in most cases resume normal life. Therefore the object of all treatment is to render the patient free from all signs of active disease, and of the stigma which so often accompany the arrest of leprosy.

The late Dr. Hansen summed up the situation for the leper in his day most vividly in his book " Clinical and Pathological Aspects of Leprosy ' when he said : " Lepers usually die before the disease has run its course. But in the maculo-anæsthetic (nerve) form the cure of leprosy is very different. We have occasionally a complete subject with vigour and good health, but usually only a miserable rudiment of a human being, with more or less paralysed and deformed hands and feet with unclosable eyes, of which part of the cornea is opaque, and from which tears run down over the cheeks, and with paralysed facial muscles unable to close the mouth, so that saliva constantly dribbles from it. Such cases, may, however live long, and reach great ages, if under such circumstances this can be looked upon as any advantage." . . . " In nodular leprosy, the bacilli in the leprous products break up into granules which finally disappear, and there remains of the leprous product only a scar in which nothing leprous can be recognised. Occasionally a widespread anæsthesia, the result of nerve affections ; and in the maculo-anæsthetic form this is the regular termination of the disease. In both cases the leprosy is completely healed."

To-day, however, the chances of completely healing the leper without permanent deformity are much greater. It is, however, unreliable to attempt to give percentages of the probable number of lepers who become " apparently

cured," as the ultimate outlook depends largely on the stage of the disease in the patient when he presents himself for treatment, and therefore, when referring to prognosis in leprosy it is convenient to describe three stages :—

1.—The early stage when the body has acquired no resistance to the invading organism.
2.—Stage of commencing resistance. When the body shows signs of reacting to the invading bacilli.
3.—Stage of subsidence of the disease.

1. *The Early Stage.*—This stage is seen in those cases who show signs of the disease in the form of a few hypo-pigmented patches or a slight loss of superficial sensation. The great majority of patients, if efficiently treated, should ultimately become symptom free. It is during this stage, which may continue on into the skin type without signs that the body is beginning to react to the enemy within, that treatment must be carried on with care. Any severe reaction, however caused, is liable to break down isolated bacillary foci, and thus lead to a general dissemination of the disease.

2. *Stage of Commencing Resistance.*—In this stage, the patient, who is generally a skin case, has had a series of reactions during the course of the disease, and the body has acquired a relative immunity and is able to destroy any bacilli which may be liberated into the circulation. Therefore, any treatment which will produce a reaction will tend to benefit the patient. In consequence it is just in this stage that the efficiency of any remedy is difficult to determine, for any treatment which will produce a reaction, *e.g.*, protein shock therapy, etc., will tend to benefit all patients who are in this stage. It must be remembered that reaction although tending to be beneficial during this stage, must be carefully controlled. Prolonged reactions weaken the patient, and therefore lower his resistance, and so would again lead to a greater dissemination of the disease. A sharp attack of lepra-fever, lasting for 24 to 48 hours, not leaving the patient exhausted, will do no harm, and frequently gives the body defences just a sufficient stimulus to cause them to overcome the invading host. If the patient has a severe form of leprosy, especially the nodular variety, the disease will take many months before it becomes arrested, and it is during the process of arrest that secondary deformities and paralysis are liable to occur, and therefore the stigmata of leprosy will ever be apparent. Although the prognosis in this stage of the disease must of necessity be guarded,

yet one can hope for a favourable result in a large number of cases.

3. *Stage of Subsidence of the Disease.*—In this stage leprosy gradually dies out of the body, and as the body overcomes the disease, nerve and other tissues are destroyed by the contracting fibrous tissue, leaving the patient healed of his leprosy, but mutilated beyond hope of recovery. Treatment will hasten this result, but cannot prevent damage already done, and therefore all the cases in this stage of the disease, if they do not die of some intercurrent infection, will, as a rule, become arrested with residual mutilation and deformities, treatment only alleviating their sufferings and hastening the process of natural arrest of the disease.

The prognosis in leprosy for those under treatment, therefore, needs careful thought, for it is different in the various stages of the disease. In skin leprosy, especially of the severe type, the prognosis should be guarded, for while the lesions are responding under treatment, secondary reactions may be taking place which will leave the patient scarred. Naturally the longer the patient has had leprosy the greater the likelihood that gross deformity will set in. While the position to-day is very much more promising, yet one must ever keep in mind the fact that leprosy is one of the most deceptive diseases the practitioner is called upon to deal with, and therefore, he should not make the mistake of being over optimistic ; but on the other hand, if there are no grounds for it, he should not be too pessimistic, because the keeping up of the morale of the patient is an important factor in combating the disease. The attitude therefore should be one of a reasoned optimism.

Ocular Leprosy.

PARK HOWELL.

THE eyes in leprosy are subject to most of the ordinary eye diseases that we find everywhere with the exception of diseases of the fundus; *i.e.*, we do not find diseases of the optic nerve, retina and choroid among lepers as a part of the leprous process; they may exist in lepers, but they either were acquired before the leprosy or exist independently of it.

In my experience among the lepers at Carville, the most important eye diseases of leprosy are keratitis, iridocyclitis, and episcleritis.

KERATITIS.

Inflammations of the cornea may be either the superficial or deep (interstitial).

In the superficial form of the disease the cornea may be marked by (*a*) many small dots or specks, or (*b*) a nebula of the outer layer just beneath the corneal epithelium. This form of the disease may increase by the formation of more and more dots and by involving the deeper layers of the cornea until either the disease becomes arrested or the vision becomes seriously impaired.

In the interstitial type the deeper structures of the corneal stroma are involved and a general haziness of the cornea results resembling luetic (syphilitic) interstitial keratitis. The essential difference between the keratitis of lues (syphilis) and leprosy is that in the former we have an intense reaction of the cornea and adjacent tissues for a time and then when the attack has spent its force the tendency of the cornea is to resume its former transparency; but in the interstitial keratitis of leprosy just the opposite occurs; the milky appearance of the cornea is gradually established, and there is no tendency for it to become clearer. Leprous interstitial keratitis is often associated with opacity of the anterior capsule of the lens.

Pathology.—The bacillus of Hansen is carried from the lymph vessels of the conjunctiva to the lymph spaces of the cornea and, from the irritation produced, the epithelioid cells infiltrate the cornea, the fixed corneal cells increase in number.

IRIDOCYCLITIS.

The iris becomes the seat of a very severe inflammation in leprosy, and with repeated attacks posterior synechia are formed which it is quite impossible to break by mydriatics (dilators) in many cases on account of the paralysis of the nerve supply of the muscle tissues of the iris. The pupil

finally becomes occluded and the muscle tissue of the iris becomes atrophied and instead of an elastic tissue the iris becomes brittle like a piece of blotting paper; many cases are difficult to operate upon on this account. When grasped with the iris forceps, instead of stretching as the normal iris does, a small piece of iris tissue comes away in the bite of the forceps. This makes it very difficult to do a neat iridectomy for optical purposes. Another difficulty is in judging when the iritis or iridocyclitis has completely subsided; when the eye appears to be quiet there is often some lurking cyclitis to be lighted up by surgical interference.

EPISCLERITIS.

This is not a serious affection in leprosy of itself. It is only because of the extension of the organisms to the underlying tissues through the lymph channels that it becomes of such great importance. In the great majority of the cases of keratitis and iritis, the bacillus of Hansen has found its way into these tissues from the pericorneal episcleritis. In keeping with other manifestations of leprosy, the leprous episcleritis is not always violently red with evidences of surrounding tissue reactions; on the contrary, the slight swelling may be of a yellowish colour, and surrounded by few dilated blood vessels of the conjunctiva. The elimination of this focus of infection by operation very often saves, or at least, postpones the subsequent iridocyclitis or keratitis and consequent loss of vision.

Many cases of these diseases go on, in spite of treatment, to blindness. In my experience, about seven or eight per cent. of all lepers become blind sooner or later as a result of these manifestations of the disease.

There are other affections of the eye which, although not apt to lead to blindness, are very disfiguring, such as falling of the eyebrows and loss of the cilia (madarosis). Paralytic lagophthalmus* is very common and is often accompanied by ectropion. This can, of course, be remedied by operation, but the effect of the result of operation is not permanent, and must be repeated. Tarsorrhaphy† is recommended in these cases sometimes at the outer canthus and sometimes at the inner, but I believe that my best results have been from a simple removal of a V in the centre of the lid.

Of course, there are other diseases leading to blindness; for instance, pannus, which seems to spread not from the upper margin of the cornea as in trachoma, but equally from all sides, leaving the pupillary area until the last, but this is not very common, fortunately.

*Inability to close the eyes as a result of paralysis.
†An operation for lessening the size of the opening between the lids.

The Treatment of the Ocular Complications in Leprosy

HENRY KIRKPATRICK.

IT is difficult to be optimistic when undertaking the treatment of the ocular complications of leprosy; one hopes, however, that some favourable response to general constitutional treatment may occur, and that, during a remission in the course of the disease, the progress of the eye trouble may be arrested, and that part of the damage already inflicted may in some degree be repaired. Although there is but little prospect of bringing the local disease to a halt whilst the constitutional disease continues active and the general resistance low, yet much may be done to lessen the destructive process and to afford some help to the sufferer.

The most important point to bear in mind is that the natural defences of the ocular tunics are likely to be impaired by a loss of sensation and by trophic changes. In some cases, too, a paralysis of the orbicularis leads to the ectropion of the lower eyelid, and to an exposure of portion of the cornea and bulbar conjuctiva in consequence. Adequate protection must therefore be provided, and wind proof goggles should be worn whenever the patient is exposed to dust and wind. Liquid paraffin, instilled into the conjunctival sac three or four times a day, forms a protective film and lubricates the membrane. A pad and bandage should be worn at night if the action of the orbicularis is defective since dessication is very liable to occur during the hours of sleep. The maxim that " prevention is better than cure " must be kept in mind, and protection should be afforded before well defined symtoms of irritation occur.

A simple, and quite a satisfactory, method of dealing surgically with an ectropion of the lower lid, caused by a paresis or paralysis of the orbicularis in anæsthetic leprosy, is the excision of a V-shaped portion of the lid. The apex of the V should, of course, point towards the lower fornix, and care should be taken to unite accurately the margin of the lid where skin meets conjunctiva. A tarsorraphy may be performed if preferred. This is also a simple procedure—the lid edges at the outer canthus are split and the raw surfaces are united by sutures.

Uveal inflammations constitute the most serious and destructive ocular complications of leprosy. It is necessary to watch for the first signs of their onset in order that treatment may be started before irreparable damage has been done. It is all important to secure full dilation of the pupil once an attack of iritis has been recognised. Otherwise the iris soon forms adhesions to the lens capsule, and the pupil becomes blocked by an inflammatory exudate. The eye of a leper often seems to tolerate atropine badly, and hyoscine drops may be substituted in such cases. A solution of hyoscine hydrobromide, 2 grains to the oz. of water, may be used, but special care must be taken to prevent its passage through the canaliculi by maintaining pressure for two minutes at the inner canthus over the site of the lachrymal sac. Sometimes this pressure is made too far forwards and then symptoms of hyoscine intoxication may occur, since the object has not been achieved. The application of three or four leeches to the temple is frequently most helpful if vascular congestion is at all marked. Subconjunctival injections sometimes seem to do good, more especially when the acute stage of the inflammation is subsiding.

Factors which might aggravate the disease must not be overlooked. Sources of focal sepsis, which are quite frequently present, should be eradicated, and active venereal disease should be treated.

Unfortunately despite the best endeavours of the surgeon occlusion of the pupil by an organised exudate may occur and lead to great impairment of vision. An iridectomy should then be performed; any operative interference, however, should be delayed until the eye has become absolutely quiet. Lepers are far from being immune from cataract, indeed they are more likely to suffer from this disease than are healthier people; one need not hesitate to operate provided the eye is quite free from inflammation.

Eye disease in a leper is without doubt always a cause for anxiety; but much may be done to prevent its occurrence and to mitigate its severity if the surgeon is watchful.

The Kahn Reaction.

R. L. KAHN.

The Kahn reaction is a precipitation method for differentiating syphilitic from non-syphilitic serum or spinal fluid. The following outline of technique is necessarily brief. For complete details, the reader is referred to "The Kahn Text—A Practical Guide" (Bailliere, Tindall and Cox, London, 1928).

I. APPARATUS.

1. Test tubes for performing test are about 7·5 cm. in length and 1 cm. in diameter.

2. Vials (with straight wall and flat bottom) for preparing antigen suspension are about 5·5 cm. in length and 1·5 cm. in diameter.

3. Pipettes : 10c.c. graduated to 0·1 c.c. ; 1 c.c. graduated to 0·01 c.c. and 0·2 c.c. graduated to 0·001 c.c.

4. Test tube rack : Made of sheet copper, 3-in. wide, 11½-in. long, 2½-in. high. Consists of three shelves, upper and middle ones containing three rows of 10 holes, each of approximately ½-in. diameter. The centre row holes are offset ½-in.

5. Shaking apparatus may be of any construction which will hold the test tube racks employed. The required speed is 275 oscillations per minute, with a stroke of 1½-ins.

6. Water bath (56° C.), centrifuge and centrifuge tubes may be of any make which will be found convenient in the particular laboratory.

II. REAGENTS USED IN KAHN TEST.

1. *Antigen.*—Standard Kahn antigen may be obtained on the market, titrated and ready for use in (1) the routine test with serum ; (2) the quantitative procedure with serum and (3) the spinal fluid procedures. Only chemically clean and dry glass vessels should be used for storing antigen, and the cork stoppers should be covered with thin high grade tin foil. Antigen should be kept in the dark at room temperature. When subjected to cold, a precipitate may be thrown down which can be redissolved upon warming the antigen in water bath at 37° C.

2. *Serum.*—Centrifuge blood specimen to remove clot and cells. Make sure that the serum when used in the test is entirely free from cells and other particles. Previous to its use, the serum is heated in a water bath at 56° C. for 30 minutes. It is desirable to use the serum soon after

heating, if possible, within 30 minutes. When heated serum is kept for four hours or longer, it is reheated for ten minutes at 56° C. before using in the test.

3. *Normal Saline.*—Prepare a solution of 0·9 per cent. sodium chloride (chemically pure) in distilled water.

III. ROUTINE (DIAGNOSTIC) TEST WITH SERUM.

This is a three tube test. Each tube contains a different proportion of serum and antigen suspension according to the following outline :—

Tube	1	2	3
Antigen suspension, c.c.	0·05	0·025	0·0125
Serum, c.c.	0·15	0·15	0·15

It is well to have everything arranged before mixing the antigen with salt solution for the test. Have racks set up, tubes numbered, sera heated and pipettes ready for measuring antigen suspension and serum. For measuring the 0·05 c.c. quantities of antigen suspension, mark off these amounts on a 1 c.c. (graduated to 0·01 c.c.) pipette with a wax pencil. For measuring the 0·025 and 0·0125 c.c. quantities, use 0·2 c.c. (graduated to 0·001 c.c.) pipettes on which these amounts are also indicated with a wax pencil.

1. *Preparation of Standard Antigen Suspension.*—Mix antigen with salt solution according to required titer. Thus, if the titer is 1 c.c. antigen plus 1·1 c.c. normal saline, mix the antigen as follows: (*a*) Measure 1·1 c.c. saline into a standard antigen suspension vial. (*b*) Measure 1 c.c. antigen into a similar vial. (*c*) Pour the salt soution into the antigen and as rapidly as possible (without waiting to drain the vial) pour the mixture back and forth six times to insure thorough mixing. (*d*) Allow the antigen suspension to stand for ten minutes before using. The suspension should not be used after 30 minutes standing.

One may mix more than 1 c.c. of antigen with a proportionally larger amount of salt solution but not less than 1 c.c. This amount when mixed with saline will be sufficient for about 15 tests.

2. *Measuring Antigen Suspension.*—After the antigen suspension has stood for ten minutes, shake it well and measure 0·05, 0·025, and 0·0125 c.c. amounts for each serum, delivering the suspension to the bottom of the tubes. When employing the standard rack which contains 30 tubes, measure 0·05 c.c. amounts in the tubes of the first row;

0.025 c.c. amounts in the tubes of the second row and 0·0125 c.c. amounts in the tubes of the third row.

3. *Measuring Serum.*—The serum should be added as soon as possible after the antigen suspension has been pipetted to avoid undue evaporation of the suspension. When examining large numbers of sera, it is well for one worker to measure the antigen suspension and for another to follow with the sera. Add 0·15 c.c. serum to the 0·05, 0·025 and 0·0125 c.c. amounts of antigen suspension, and shake the rack of tubes vigorously for ten seconds to insure thorough mixing of the ingredients. The rack can now be set aside until the remaining tests are ready for the regular three-minute shaking period.

4. *Controls.*—At least one positive and one negative serum control should be included with each series of tests. Every serum giving a positive reaction should be examined to establish that it is free from red cells or foreign particles which might be confused with a specific precipitate. Dilute 0·1 c.c. serum with 0·3 c.c. saline. Shake well and examine for particles. If particles are present, the serum should be recentrifuged and retested.

5.—*Shaking.*—During the three-minute shaking period, it is important not merely to agitate the rack of tubes, but to see to it that the fluids within the tubes are vigorously agitated. When shaking by hand, one may shake three one-minute periods with short rest periods. When a shaking machine is employed, its speed should be from 275 to 285 oscillations per minute, with a stroke of 1·5 inches. Shaking by hand should approximate this speed.

6. *Addition of Saline.*—After the tests have been shaken, add 1 c.c. saline to each tube of the first row of the rack (containing the 0·05 c.c. amounts of antigen suspension) and 0·5 c.c. saline to the remaining tubes. Shake sufficiently to mix ingredients.

7. *Reading Results.*—The results are read after the addition of the salt solution. Optimum reading conditions in each laboratory should be determined by trial. The following points will be found helpful: (*a*) When utilising daylight for reading the tests it is well to have but one source of light coming from a single window immediately in front of the reader. It will be found satisfactory to shade the lower three-fourths of the window, narrowing the sourse of light to a small section at the top of the window. Light from any other windows near the reader should be dimmed by lowering

the window shades. (*b*) When holding the rack in front of the exposed section of the window, the definitely positive and the negative reactions are readily differentiated without lifting the tubes from the rack. (*c*) In case of weak reactions examine each tube individually, lifting it several inches above the eye level, and slanting it until the fluid is spread into a thin layer. The precipitate will then become readily visible.

Those preferring magnification will find the microscopic mirror helpful. Place mirror on reading table with concave surface upward. Hold the tube in slanted position two to three inches above the mirror and examine the image in the mirror. Both daylight and artificial light may be employed. One may also utilise an ordinary hand lens for reading the tests. A two or three-fold magnification will be found satisfactory. Some workers prefer the use of a slit-light arrangement, the source of light being an electric bulb enclosed in a box which is provided with a narrow slit.

As far as possible, workers should limit themselves to one method of reading. The occasional use of magnification by readers who usually do not resort to it might affect the uniformity of their reading scale. The magnification must be sufficiently low in order to assure opalescent and clear cut negative reactions, with entire freedom from visible particles.

8. *Interpretation of Results.*—A definite precipitate suspended in a clear medium is read four plus. Proportionally weaker reactions are read three, two and one plus and doubtful, respectively. The final result of the test in all cases is the average of the readings of the three tubes, as indicated in Table I.

9. *Recording Results.*—Make a permanent record of findings in all tubes of each test at time of reading. Preferably, the tests should be read independently by two separate workers. When two workers are not available, the original reading should be checked by the same worker after a short interval.

TABLE I. OUTLINE OF KAHN TEST AND INTERPRETATION OF RESULTS.

Tube No.	1	2	3	Completion of Test.
Serum : Antigen suspension..	3 : 1	6 : 1	12 : 1	Tests are shaken three minutes, 1 c.c. salt solution is added to first tube and 0·5 c.c. to other two tubes and results are read.
Antigen suspension, c.c.	0·05	0·025	0·0125	
Serum (heated at 56° C. for 30 min.) c.c. ..	0·15	0·15	0·15	

INTERPRETATION OF RESULTS.

Reaction No.	——	——	——	Final Result (Average of Reactions of Three Tubes.)
1.	++++	++++	++++*	
2.	+++	++++	++++	++++
3.	++	++++	++++	
4.	+	+++	++++	+++
5.	—	+++	++++	
6.	—	++	++++	++
7.	—	—	++++	
8.	—	—	+++	+
9.	—	—	++	+
10.	—	—	+	—
11.	—	—	—	

* Weakly positive sera show most marked precipitation in the third tube because a small amount of *reagin* reacts best with a small amount of antigen suspension, the relatively larger amounts of suspension in the first two tubes being inhibitory to precipitation.

Strongly potent sera show four plus precipitation in each tube, but due to the different amounts of antigen suspension employed, the precipitates are of unequal bulk, being greatest in the first tube and least in the last tube.

In rare instances an a-typical reaction is obtained in which precipitation is marked in the first tube and weak or negative in the second and third tubes. In such a case, a quantitative test should be made and if the result is 20 units or more, the qualitative reaction may be considered four plus; if less than 20 units, the results of the qualitative reaction should be averaged.

10. *Procedure with Less than Three Tubes.*—If there is insufficient serum for the three-tube test, examine and report as follows: (*a*) If enough serum for two tubes, employ the lesser amounts of antigen suspension. Report as a two-tube test. (*b*) If enough for one tube, employ the least amount of antigen suspension. Report as a one-tube test.

Types of Reaction in Individual Tubes.—(*a*) Four plus reactions. In these reactions, definitely visible particles are suspended in a transparent or opalescent medium. The individual particles are readily visible by direct examination without lifting the tubes from the rack. (*b*) Three plus reactions. In these, the particles are also definitely visible, but are less clear-cut than in four plus reactions. The particles may not always be distinguished until the tube is lifted from the rack and examined individually. (*c*) Two plus

reactions. In these, finer particles are suspended, frequently in a somewhat turbid medium. The particles cannot be distinguished until the tube is examined individually, usually by slanting. (*d*) One plus reactions. In these, still finer particles are suspended in a somewhat turbid medium. (*e*) Doubtful reactions. In these, extremely fine particles, just within the visible range, are suspended in a somewhat turbid medium. (*f*) Negative reactions. In these, the medium is transparent, opalescent and free from visible particles. In the rack, negative reactions are readily distinguished from weakly positive reactions by the fact that the latter appear turbid.

The Early Treatment of Leprosy.

H. F. HOFFMANN.

FROM personal experience in the leper home at Havana I am convinced that in chaulmoogra oil we have a specific treatment for leprosy. The derivatives of the oil can now be given in large doses intravenously with little difficulty, and from my own experimental evidence I feel sure that the curative value of the medicaments will be increased when modifications of the active substances of the oil are used, especially if treatment is combined with other substances such as gold or antimony.

It was only a comparatively short time ago when the opinion, which is as old as humanity, that leprosy was incurable, was universally held. This view in some places has not yet changed despite the completely altered situation. My own personal opinion is that leprosy can be cured and we should endeavour to cure as many cases as possible. In civilised countries, at any rate, the leper problem is more of a hygienic one than the social one it formerly was, and is still to a large extent in primitive countries.

Because of the incurability of the disease rather than its infectivity the system of compulsory segregation was resorted to in the past. This statement is made because, in my opinion, the most severe isolation is not sufficient to control the disease for the reason that under such a system the least infective burnt-out cases are isolated and the more dangerous early cases remain at liberty.

As a result of the recent advances, segregation no longer

remains the only measure against leprosy. Under normal sanitary conditions the control of leprosy should pass completely to the health authorities who should lay emphasis on the early diagnosis and treatment. Wherever a neglected case is found the health authorities should institute investigations to discover the reason why the case was concealed in order that such situations may be avoided in the future. Special measures should be taken for the immediate care of all early cases. It should be remembered that many of the mutilated hopeless cases that fill the leper homes have had their infection for many years before they became a public scandal or danger.

In countries where it is feasible a systematic examination of all contacts of each known leper should be undertaken. In this way, the early case would be discovered on the first appearance of clinical signs, which, in the absence of a reliable serological test, is the only method of detection. Examination of all contacts should be repeated periodically for a number of years so that the first signs will be discovered.

In my own opinion the result of treatment in the early case is most satisfactory and is to all intents and purposes a cure. Even though in the later stages one cannot get rid of all bacilli in the body, yet, the danger of infection can be largely overcome.

Personally I consider one of the most serious obstacles in the persuasion of the early cases to come for treatment is the system of segregating early cases with the late hopelessly deformed ones. The leper home proper should be confined to advanced cases, for no person with the initial signs of leprosy, which in the beginning he considers only a skin disease, will ever undergo treatment in such a place if he can avoid it. In addition it is unnecessary to isolate such a case for life when, if properly treated, he should be cured in one to two years.

The modern leper clinic which is in existence in a few countries, must be entirely different from the asylum. In passing I must pay a tribute to those noble souls who dedicate their lives to the care of lepers in such institutions. If any progress towards the control of leprosy is to be made it is necessary completely to separate the leper home from the modern leper clinic ; both have their own problems but they must be independent of each other.

The advanced cases who do not need, or want, specific treatment, or who are a public danger or nuisance should be isolated in the leper home, where they will find the necessary care and control. The less developed a country, and

the greater the number of uneducated persons, the greater will be the need for the old isolation hospital as a social, charitable and protective institution. With the progress of modern civilisation and the growth of an intelligent public the control of leprosy should be based on hygienic methods, of which early treatment is the most important.

The treatment is so simple that any medical practitioner can give it. In the public interest however, free treatment should be given in specially organised, easily accessible clinics. Smaller centres, perhaps attached to the public hospitals, should be distributed over the whole country for the treatment of ambulatory cases. These should be under the direction of the local health officers.

Completely equipped leper clinics should be established in the capital town or other convenient centres, where cases can be admitted. This central clinic should be equipped as a modern hospital with all necessary material. It should also be a centre for research on leprosy and should be directed by whole time research workers. The whole future of the leprosy problem depends on research, and the leper clinic is the most suitable place where such work can be undertaken. In the central clinic there should be facilities for teaching the health officers, private practitioners and others in diagnosis, treatment and prevention of the disease.

A complete system can thus be organised and a frontal attack made against leprosy, and this must result ultimately in the elimination of the infectious cases and with it the endemicity of the disease, as there is no other source of infection known to exist but the leper with open leprosy.

Much work is still necessary in order to find the most reliable methods of diagnosis and the ideal form of treatment, especially in the initial stages of the disease. The majority of early cases ought to be found by systematic examination of the families of manifest lepers. The practical realisation of the modern campaign against leprosy depends on the organisation of special leper clinics and dispensaries. The old leper home should be exclusively for the care and control of the abandoned cases, and will gradually disappear as a country progresses towards more hygienic and civilised conditions.

Pathological Changes in the Central Nervous System in Leprosy.

H. P. LIE.

Summary of a Lecture to the Scandinavian Pathological Society, held at Helsingfors in July, 1929.

DR. LIE commenced by referring to his previous investigations, and reports in this lecture further work which he has carried out on the central nervous system in leprosy.

It was stated that the degeneration in the dorsal columns of the spinal cord was so definite and occurred so frequently, with only small variations, that it might be regarded as characteristic and typical of leprosy. This degeneration differs from that seen in grave diseases associated with cachexia (emaciation), also from that seen in tabes dorsalis (syphilis of the spinal column). Dr. Lie went on to state that his most recent investigations gave support to his former hypothesis that the appearances in the dorsal columns of the spinal cord are due to peripheral nerve changes rather than to the actual attack of the cord by leprosy, although leper bacilli could be demonstrated in the ganglion cells of the spinal cord.

Emphasis was laid upon the degeneration being most pronounced in long standing cases of maculo-anæsthetic leprosy, where it is seldom possible to demonstrate leprotic changes in the spinal ganglia, but where peripheral neuritis has been markedly conspicuous. In nodular leprosy also spinal cord degeneration is found very definitely in all cases which progress slowly, and assume the picture of nerve or anæsthetic leprosy (secondary anæsthetic cases). In such cases, too, leper bacilli are found very frequently in the larger motor ganglion cells of the spinal cord. In cases of nodular leprosy, where there are few signs of nerve involvement, little or no evidence of degeneration of the spinal cord can be discovered, although bacilli can actually be demonstrated in the motor ganglion cells. On the whole, one gets the impression that the ganglion cells suffer less damage from the leper bacilli than one might expect. The author was able to demonstrate leper bacilli in the nuclei of the medulla oblongata, particularly in the nucleus of the facial nerve in a case where there had been no sign clinically

of any affection of the medulla oblongata, nor of the facial nerve. This demonstration of bacilli in the medulla oblongata has not been previously made to his knowledge. The granular appearance of the bacilli, and the fact that they occur always singly and not in heaps in the ganglion cells, suggest that the leper bacilli cannot multiply in the ganglion cells, but rather become destroyed, while the ganglion cells appear to act as phagocytes.

The author has attempted to trace the degeneration in the dorsal columns of the cord, in a central direction towards the brain, above the medulla oblongata to the thalamus, but it would seem that this degeneration cannot be demonstrated above the nucleus gracilis and nucleus cuneatus. The degeneration must be regarded therefore as affecting only the primary peripheral sensory neuron.

During the last few years the author has undertaken detailed microscopical investigations of five brains from three cases of nodular and two cases of maculo-anæsthetic leprosy, the latter being mentally deficient, in an attempt to find leper bacilli in the brain or its coverings. In the case of the two mentally deficient maculo-anæsthetic lepers it was quite impossible to demonstrate bacilli in the brain or elsewhere. In two of the nodular cases some few bacilli were observed in the pia mater about the infundibulum, also a couple of bacilli in a vessel wall in the thalamus from one case, and in a vessel wall in the middle of the medulla oblongata in the other. In the one case a monocyte full of leper bacilli was found in the middle of a vessel in the pia. Neither of these two cases showed any evidence of mental disease.

All things considered it would appear that the brain, *i.e.*, the ganglion cells of the brain, possess a certain immunity against the leper bacilli, which does not appear to be the case on the part of the ganglion cells in the medulla oblongata, medulla spinalis or the spinal ganglia. In all cases of nodular leprosy there is without any doubt a more or less heavy invasion by leper bacilli of the whole central nervous system including the brain, but it would seem that the physiologically different ganglion cells behave in a different manner towards the leper bacilli, and that the cells of the cerebrum are the most resistant. This may have some significance in our interpretation of the etiology of mental disease occurring in lepers. The author has personal knowledge of nine mentally deficient lepers, five men and four women. Only two of these nine suffered from nodular leprosy in which leper bacilli occur in real abundance. The remaining seven, some of whom were quite light cases, had maculo-anæsthetic

leprosy. In two cases the mental trouble broke out before the presence of leprosy was detected and cannot therefore be set in etiological relationship to it.

In two cases, as already mentioned, it was not possible to demonstrate leper bacilli in any part of the body, certainly not in the brain. The clinical picture in the nine mental patients was very variable and not uniform as one would be inclined to expect, if the mental disease had been due to invasion of the brain by leper bacilli. One woman had a true melancholia; one man and one woman had mania. The man had paranoiac delusions with the maniacal outburst. One woman had a maniacal-depressive psychosis, while three men had paranoia of medium severity. One woman suffered from dementia, and one man from a mental condition giving an indefinite picture, which probably had an arterio-scleratic basis. None of the mental patients in question showed any symptoms which might be regarded as Korsakow's disease or Korsakow's syndrome.

Taking everything into consideration, the author, therefore, is of the opinion that mental disease in a leper is not directly due to invasion of the brain by leper bacilli, or to their toxins, but that the mental disease, provided that it is not a chance coincidence, is of psychogenic origin. To become a leper has been considered from all times to be one of the greatest misfortunes that can befall anyone, and it is easy to assume that this may have so great an affect upon a predisposed mind as to give rise to a true psychosis.

Literature.

Leprosy: Summary of Recent Work, No. 17. This is a reprint of the Leprosy sections from the Tropical Diseases Bulletin.

Leprosy in India, No. 2. October, 1929. Issued quarterly by the Indian Council of The British Empire Leprosy Relief Association.

Leprosy in the Far East—A Survey. (Price 2s.) By Dr. R. G. Cochrane.

Leprosy in Europe, the Middle and Near East, and Africa. —A Survey. (Price 2s.) By Dr. R. G. Cochrane.

Leprosy: Symptoms, Diagnosis, Treatment and Prevention. (2nd revised edition). (Price 2s.) By Dr. R. G. Cochrane.

Recent Advances in the Treatment and Prophylaxis of Leprosy.

CAMERON LECTURE BY SIR LEONARD ROGERS.

The full abstract of this Lecture delivered at Edinburgh University appeared in the "British Medical Journal," November 23rd, 1929. We are indebted to the Editor of the "British Medical Journal" for permission to reprint it.

SIR LEONARD ROGERS stated that the time was ripe for a review of the recent advances in the treament of leprosy and their bearing on prophylactic measures to reduce the incidence of this ancient and dreaded disease. It was estimated that it affected some three million people in the world, and about half a million in the British Empire. The task of reducing leprosy was heavy. It would never be accomplished by the mediæval method of compulsory segregation, with the inevitable hiding of patients in the early more curable stages of the disease. Sir Leonard pointed out that after a close study of the literature of the subject he had come to the conclusion that in 80 per cent. of the cases the infection was contracted by living in the same house with a leper, although only 3 to 5 per cent. of those so exposed contracted the disease; this showed that the disease was only slightly contagious. In 80 per cent. the incubation period was less than five years.

EVOLUTION OF LEPROSY THERAPY.

Among the more common and unsatisfactory methods of treating leprosy formerly might be mentioned local applications and surgical operations; the use of mercurial, copper, gold, arsenical, and antimony compounds; vaccines made from supposed cultures of the lepra bacillus and other saprophytic organisms, including nastin; tuberculin; sterile emulsions of leprotic nodules; and protein shock treatment. Of all of these it might be said that in no appreciable percentage of cases had they brought about lasting disappearance of all the active signs of leprosy. The fallacies of treatment were next pointed out, including those due to the variable course of the disease, and especially the spontaneous great improvement which temporarily followed the acute phase, and was likely to be erroneously attributed to any drug which happened to be given at that time. It was

necessary to treat a considerable number of cases for long periods to enable any reliable conclusions to be reached.

The one ray of hope derived from a study of the older literature was the frequency with which slight febrile and local reactions, more particularly after vaccines, had often been followed by considerable temporary improvement. If a method could be devised of producing repeated slight reactions with a fair degree of cetainty an advance should result. Potassium iodide had long been known to cause reactions of diagnostic value, and recently E. Muir reported good results from this drug in doses of from 1 to 240 grains.

The story was then related of how the old Indian remedy chaulmoogra oil was introduced to European medicine by Mouart of the Indian Medical Service in 1854, and its failure to do more than retard the progress of typical cases of leprosy, owing to its nauseating nature. In 1904-7 Power had separated chaulmoogric and hydnocarpic acids from both the chaulmoogra oil of Burma and the hydnocarpus oils of India and Indo-China. In 1914, Victor G. Heiser recorded promising results from prolonged and painful intramuscular injections of the Mercado mixture containing one-third of chaulmoogra oil; in the following year Sir Leonard Rogers, at Heiser's request, renewed his former efforts to obtain a soluble preparation of the active principle of the oils on the lines of his previous success with emetine, the active principle of ipecacuanha. He soon found that a solution of sodium gynocardate injected subcutaneously, although painful, was an advance on the oral treatment. In 1916, he discovered that this preparation could also be used intravenously with safety; slight febrile or local reactions occurred, accompanied by extensive breaking up of the bacilli in the leprous tissues, and followed by more rapid improvement and the ultimate disappearance of all clinical signs and bacterial infection in a number of comparatively early cases obtained from among hospital out-patients. Further repeated injections of this preparation produced gradual breaking up and disappearance of the lepra bacilli in nodules, and the slow development of immunity even when little or no evident reaction occurred, with eventual clinical cure and removal of all infectivity. As the result of several years' patient work it was established that the high melting point chaulmoogric acid fraction was useless, but the lower melting point hydnocarpic acid and the so-called gynocardic acid constituted the active rts of the oils, which could best be obtained from the eed of the hydnocarpus wightiana of Southern India.

Of 51 cases of leprosy treated with the hydnocarpates and gynocardates for three months and upwards in the course of five years, 40 per cent. completely cleared up, and another 40 per cent. were greatly improved.

Meanwhile, in 1919, a useful modification of Sir Leonard Rogers' method had been introduced by Hollman and Dean in Honolulu—namely the less troublesome intramuscular injections of the ethyl esters of the whole oil in the form of a thin oily liquid; this preparation had for long been used with much success in Hawaii, at the Culion leper settlement of the Philippines, and by E. Muir in Calcutta. In 1925, E. Muir reported success following the subcutaneous and intramuscular injection of pure fresh hydnocarpus wightiana oil with 4 per cent. creosote as an antiseptic, which was less than one-twentieth the cost of a good ethyl ester. In 1927, the lecturer recorded the elimination of the vein difficulty by using sodium hydnocarpate. Dr. T. A. Henry prepared a substance—alepol—the sodium salt of the lower melting point fatty acids of hydnocarpus wightiana oil, from which he had removed the irritant properties of Rogers' early preparations. Alepol was very effective and painless, whether injected subcutaneously or intramuscularly; it could also be used intravenously in the few cases requiring this procedure by Muir's simple expedient of drawing up about an equal quantity of blood from the vein into the syringe which contained the dose, and then injecting the mixture.

The results obtained in the largest series of cases yet reported showed 41 per cent. of clinical cures by Rogers' intravenous method, and 31 per cent. by Muir's subcutaneous and intramuscular injections, both series being mainly composed of earlier hospital cases than those seen in leper asylums under the compulsory system. Dr. Isabel Kerr, in her leper hospital at Dichpali, obtained 17 per cent. to 19 per cent. cleared up, and 63 per cent. became bacteriologically negative and uninfective. The most extensive trial in 6,000 advanced cases of eight years' average duration on admission at Culion, reported on by H. W. Wade and C. B. Lara, showed from 15 per cent. clinical cures, with a total now amounting to over 1,000 cases. Thus it was clear that, as might have been expected, the results were much better in the case of persons in the early stages who had been attracted to voluntary clinics than in the patients with advanced disease, who were obtained by compulsory segregatation. The importance of finding the early stages was well illustrated by the results in 486 lepers treated at the Honolulu hospital during five years; these showed 8 per cent.

of recoveries in very advanced cases, 38 per cent. in moderately advanced and 64 per cent. in early cases. It was clear, therefore, that anything which led patients in the early curable stages to hide away, as was inevitable under rigid compulsory segregation, might in these days easily do more harm than good, and actually retard the reduction of leprosy.

Sir Leonard Rogers then discussed the necessity of modifying rigid compulsory segregation in order to attract the early clinically curable cases. He advocated the system already adopted in Mauritius, and about to be legalised in British Guiana, namely, that cases reported by an expert committee to be non infectious should be treated at clinics or at home. No such compulsion was attempted in our tropical African possessions, yet some 5,000 new cases were attracted to voluntary clinics and colonies last year alone. In view of the facts already mentioned—that 80 per cent. of leprosy was contracted by living in the same house as a leper, and that in 80 per cent. the incubation period was under five years—the lecturer submitted a scheme which provided that as soon as a leper was found all his household were examined for early cases; this was repeated every six months for five years. In this way, some 80 per cent. of the probable infections from the case should be detected in the early stage; a considerable majority of the patients would be cured and prevented from becoming infective, with a corresponding reduction in the remaining foci of infection. Since patients with advanced nodular disease died in from eight to ten years, and the nerve cases became uninfective, by repeating this process for a second five years few infective cases would remain. A great reduction of leprosy would result within a single decade wherever this simple plan could be put into operation. The recent advances in the treatment of leprosy should therefore be regarded as being by no means the least of the romances of modern medicine.

Industrial Therapy in Leprosy.

R. M. WILSON.

IT has been the custom in most of the older leper colonies just to take in the bad cases that come for life, feed, clothe, and care for them just as so many sick bed-ridden cases. In many of these colonies cooks, water carriers and servants are provided. In many instances, the spots of leprosy are no more of a handicap than so many freckles, and it is a serious mistake to allow these cases to do nothing. Occasionally, however, a leper is really sick and should be kept in bed. We find that work and exercise are most important in the treatment and should be encouraged as a therapeutic agency.

The leper offering the most hope of cure is the one in the early stages of the disease, and 95 per cent. of these are able to work and are the better for it. Our leper colonies should be schools, teaching (1) the three R's ; (2) personal hygiene ; (3) the importance of living apart and not giving offence to others after returning home ; (4) some trade or occupation. I am speaking of countries where only a selected number can be taken in. Cases should be selected and told distinctly that they are coming in for three or four years, and a definite line of work and study planned for them. They should be taught the signs of return of the disease, so as to be on the watch for it, also how to care for their own health after leaving. An idle brain is the devil's workshop with the leper, as with anyone else.

Every colony should have a farm, or at least plenty of garden land, where the patients can grow their own vegetables. For some years we have made it a rule to purchase no vegetables, and for the lepers to grow their own supplies. Our patients are also able to fish as we are on the sea. They also make all pans and buckets, and do much in the tin line ; they do all cooking and preparing of food, erect all buildings, and do the carpentry work about the place. They also make all their own clothes. There are other lines of work for which we hope to train them later, and they should even be able to keep books and records. Our lepers do 80 per cent. of their own medical work, and I hope to teach them to do the other 20 per cent. later. We make nothing for the market, but in some colonies this is done and the material is sterilised. The busy working leper is far happier, and will show better results in treatment, because his circulation, bowels, appetite and general health will be

better for the work. From an economic standpoint also there is great saving.

It is difficult to think of any disease where work and exercise are so essential as in the treatment of leprosy. Exercise is extremely beneficial to the healthy individual, and it is doubly so to the leper. While our industrial work was started for economic reasons, it is now proving to be one of the best agencies in treatment.

Let us take some of the symptoms of the disease and consider the possible benefits that might be expected from exercise.

Skin Symptoms.—As the disease is located mainly within the skin itself, it is more or less a skin problem, with hordes of the bacilli within the skin. It would be natural to expect exercise and massage of the skin to result in elimination of much of the poison from this route.

Nerve Symptoms.—Atrophy. The destructive process going on in the nerve endings results often in muscular atrophy. If untreated there is a gradual withering of certain muscles, but systematic and regular exercise will give muscular tone and help prevent a certain amount of this loss, especially if started early.

Neuritis is no small problem in leprosy, due, I suppose, to the irritation of the nerves from the toxines in the system. Some of these cases are benefited by mild exercise, though some can hardly bear the slightest motion of the limbs or body. The coal tar products, adrenalin and tetrodotoxin should be tried. The latter drug is made by Sankyo and Co., a Japanese firm, from some poisonous portion of the globe fish, and is highly beneficial in many of the neuritis cases. In some cases it is the only thing to give relief and acts quite like an opiate.

Where there is exercise the circulation is also improved, and there is a better tone to the muscles, and more bacilli are eliminated. Elimination is a most important matter in treating leprosy, for since the chaulmoogra oil is supposed to destroy the bacillus it must be thrown off as fast as possible. Exercise brings into full play the kidneys, skin and bowels. Constipation is usually one of the great problems to deal with, due to the patients' sedentary life. One rule in our colony is that those not actively engaged in the various industries must take long walks daily. A beautiful highway through the colony, making a figure of 8, was prepared specially for this purpose. The appetite is much better in those at work, and the taking of an abundance of vegetables helps also to overcome the constipation.

The mental attitude requires special attention in treating lepers, and the most cheerful surroundings possible should be secured for them. Upon arrival the leper is down and out, discouraged and despondent, as all have told him that he has the greatest of all incurable diseases. He is feared by all, driven from pillar to post. What hopes could there be for improvement in such a mental attitude? Such a case must not be allowed to sit and mope and nurse a cold paralised hand or foot. His surroundings should be cheerful, and he should be given a job which will shorten the day. Some task such as making a table, a bucket or a wagon gives him something to do and think about, and he will feel that life is worth living. A few copper coins at the end of his week's work will bring an added joy, and this helps to get many out of bed who would otherwise remain there.

Other diversions in our colony are music, games, field day sports, fishing, church services, school, etc. The effect of work upon the dosage of chaulmoogra oil is shown by the fact that our lepers who are at work can take a much larger dose of the oil with the least inconvenience, because of the favourable effect of exercise.

The work most suited for lepers is farming or gardening, which brings them into the sun and open air. The anticipation of the coming melon, pumpkin or other vegetable brings some joy and stimulates him to work. In our colony the occupants of each room form themselves into a club. Each club is required to grow its own vegetables, and the strong must help the weak. We have trained many as carpenters, stone masons, stone cutters, tinners, weavers, hospital helpers and nurses, and in other lines of work. All cooking, washing, sewing and such work is done by the lepers, and the only person employed about the institution is one healthy book-keeper or secretary. During the past two years 45 stone cottages and buildings have been erected by the lepers.

The following study was made of 277 of our cases who have been steadily at work, and showing good results from treatment.

128 stated that their strength upon entrance to the colony was only fair, and 139 very poor, but now after 12 to 18 months treatment the strength in 227 is very good and rather poor in 50.

In 247 the stiffness in their hands and joints has improved, but in 30 no improvement is seen. If advanced paralysis of the arm or limb has taken place very little improvement can be expected.

268 state that their sleep is good and sound, and only eight state that it is poor. Work certainly helps sleep. In 271 cases the appetite is good, and poor in six cases. In 221 no constipation is reported, but 56 are still troubled with it, in spite of the work.

We hold a big field day for sports twice annually, and rarely does a new case enter into these, but after work and

training in the colony many of these cases enter for the races.

As regard medical treatment, we use weekly subcutaneous injections of fresh hydnocarpus oil, with 2 per cent. camphor. We have used many combinations and various preparations, but found none so satisfactory and give so little pain as this preparation. In syphilitic cases we simply add half grain salycilate of mercury to the regular weekly chaulmoogra injection. Many of the syphilitic cases will show no improvement until the syphilis is treated also.

Dr Wade writes me that they encourage work in the Philippines. I noted in my visit to the Hospital No. 66, at Carville, Louisiana, that some of the cases were provided with jobs. Every leper colony should adopt the work system. " Faith, oil and work, but the greatest of these is work."

To attain good results in treating leprosy, early diagnosis with chaulmoogra oil, an abundance of out-door work, with as much cheer and diversion as possible, will bring about the most encouraging results in the majority of cases. Instead of housing hopeless lepers until their death, we should work towards making every leper colony an industrial therapeutic institution.

Leprosy in Korea.

HENRY FOWLER.

IT is evident that the authorities in Korea within the narrow limits of their financial resources are making earnest efforts to free the peninsula from the menace of leprosy.

So desirable a programme, however, will in all probability take many years yet to accomplish. Although the favourable results of modern treatment reported from Korea outnumber those of other countries, the fact remains that many subacute and chronic cases of both nodular and anæsthetic leprosy seem little helped by remedial agencies. To add to the difficulty, early cases of leprosy and the anæsthetic type are not always recognised, and those untreated are a constant danger to those with whom they associate. Undoubtedly, the educational authorities of Korea have a colossal task to accomplish before even the most elementary laws of public health and hygiene are apprehended by the people.

Under the auspices of the Australian and American Presbyterian Missions, homes for lepers have been erected from time to time in the leper areas of South Korea from funds specially supplied by the Mission to Lepers in London and New York.

From the very beginning, for obvious reasons, the Korean Government has been favourable to these christian philanthropic developments. Built without cost to the colony, under the gratuitous personal care and supervision of the medical missionaries and other agents of the several missions, the lepers, crowding into the homes, even before they are properly equipped, have throughout been happily cared for, maintained, clothed and fed. Within recent years modern treatment has also been extensively carried out, often with remarkable success.

With the ever rising cost of food stuffs and all commodities throughout the Far East, and the increased cost of conducting these christian leper homes, the Governor-General of Korea, Viscount Saito, was led to sanction and contribute through the several missions, a daily grant of ten sen per leper (about 2¼d. in English money). The remainder of the cost of maintenance and upkeep has so far been met from funds supplied by the Mission to Lepers.

According to the most recent reports the number of lepers accommodated in Government and Mission leper hospitals is 2,150. Of these, 427 are cared for at the Government leper colony on Little Deer Island, South Keisho Province; 406 are inmates of the Northern Presbyterian Mission Leper Home at Taiku; 536 are accommodated in the Fusan Leper colony, under the superintendence of members of the Australian Presbyterian Mission; the remaining 781 are housed in a leper colony recently established in Soonchun under the supervision of the Southern Presbyterian Mission.

The Government returns indicate that there are in addition 5,355 persons in Korea known to be lepers; of these 1,443 are vagrants, 1,237 are likely shortly be become so, and 2,675 are said to have means of support apart from State and the other public funds. Probably, all acquainted with conditions in the Far East will hesitate to accept these figures as final. It will be observed that the estimated Korean leper population, as given by responsible leper workers in the country, far outnumber these totals.* Unquestionably, many early cases of leprosy and others will have been unobserved by the non-medical officials

* (*See* A Survey of Leprosy in the Far East, by Dr. R. G. Cochrane, p. 17.)

responsible for the leper census. All that can be said is that the various proportions of pauper lepers and the comparatively well-to-do lepers probably approximate the actual state of affairs.

It is reported that the Government is now considering the advisability of taking new measures for the control and relief of all vagrant lepers. Further, it is hoped that before long the existing leper establishments will be extended and that new leper asylums and homes will be built in other leper infected areas.

The possibility also of increasing grants in aid both to government and christian leper homes from state funds is being considered.

Correspondence.

SIR,

With reference to the letter from Dr. Percy M. C. Peacock, Superintendent, St. John's Leper Home, Mandalay appearing in LEPROSY NOTES, for October, 1929, I have the honour to inform you that the facts are as follows :—

A Sister of the Franciscan Order who was working in a Dispensary for the Poor in Coimbatore, South India, developed, about three or four years ago, symptoms suspicious of leprosy. She was brought to Ceylon and examined by the Medical Superintendent of the Chief Leper Asylum in this Island, who diagnosed the case as leprosy. She was admitted to the Leper Asylum at Mantivu, and has been there ever since. This Sister has never worked in a Leper Asylum in India, Ceylon or Burma.

It may interest you to know that Sisters of the Franciscan Order have been working in the two Leper Asylums of this Island for 15 years, and that we also are in the proud position of being able to state that there has not been yet a case of leprosy contracted amongst them.

I am, Sir, Your obedient servant,

(*Signed*) J. F. E. BRIDGER.

Director of Medical and Sanitary Services.

Colombo.
November 11th, 1929.

"A CURE FOR LEPROSY."—A REPUDIATION.

SIR,

In August last, the proofs of an absurd, grossly inaccurate, and sensational article on "a cure for leprosy," alleged to have been written by me, and in which my wife's name was gratuitously and incorrectly dragged in, was sent to me for correction by an old and reputable British popular paper. On my informing the Editor that I had never written any such article, which was grotesquely incorrect in nearly every line, he courtiously withdrew it and told me that it had been purchased in good faith from some American Press agency, which is certainly not lacking in enterprise. Soon after I had to repudiate the same article on its appearance in a leading paper in India, which had also accepted it in good faith. I have since received letters from other widely separated countries which appear to relate to the same article, which in one case even deceived a medical man in a responsible position, who ought to have known better than to think me capable of writing such a farrago of nonsense. I am, therefore, taking this early opportunity of once more repudiating it, although I fear it will be impossible to catch up such a tissue of false statements, once it has gained a long start.

Let me state clearly once again that I have never claimed to have discovered an infallible cure for leprosy, but in view of the recent award to me for my researches on the treatment of leprosy by the Edinburgh University of the Cameron Prize in Therapeutics, which has an international standing and distribution, I believe I may justly be considered to have gained for the British Empire a share in the credit for the establishment of a greatly improved treatment of leprosy, which at least enables a large proportion of early cases to be "cured" in the clinical sense of the term, and thus to have forged a weapon which will allow leprosy to be reduced greatly in the British Empire and elsewhere within the next few decades, which is the essential aim of our Association.

Yours faithfully,

LEONARD ROGERS.

London, N.W.6.

December 20th, 1929.

Grants for Leprosy Work.

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

	£
KENYA COLONY.	
Church of Scotland Mission, Tumutumu... ...	250
TANGANYIKA TERRITORY.	
Africa Inland Mission, Shinyanga	500
C.M.S., Berega	100
GOLD COAST.	
White Fathers' Mission, Navrongo	150
NORTHERN RHODESIA.	
U.M.C.A., Fiwila	70
CYPRUS.	
For expenses of sending doctor to India for special leprosy training	200

These grants have been made for the provision of buildings and simple housing accommodation for lepers undergoing regular treatment, drugs, equipment, etc. 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.