

# Statement of Progress made in Leprosy Work in the Federated Malay States in 1933.

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THE year commenced with 1,082 patients. In spite of the transfer of 100 patients to the Leper Settlement at Pulau Jerejak in Penang and the year's casualties and discharges, the numbers have risen to 1,104 and are steadily rising. The total number of people treated in the Settlement during the year was 1,531.

There has been an unprecedented rise in the number of admissions during the year, the total amounting to 449. It is noteworthy that the proportional number of women has increased and more than that of the males—the females have increased by 23.5 %, the males by 8.5 %. One gratifying feature of the increase in admissions is the definite rise

in the number of Malays who are conservative in outlook and not easily persuaded to accept Western treatment. In 1932, eight Malays were admitted : forty-two were admitted in 1933. It is hoped that further admissions will make possible a further study of indigenous leprosy. There are obvious and striking differences in the type of leprosy affecting Southern Indians as compared with Southern Chinese. The fact that Malays are beginning to seek the benefits of anti-leprosy treatment may afford an opportunity to study further evidence with regard to racial modifications of the disease.

Another interesting feature of the admission rate is the relative increase during the months of September and December. On enquiry among the patients I find that they attribute the rise to the fact that descriptions of Sungei Buloh and its treatment were published in the vernacular newspapers in the months of August and November. The Malays declare that propaganda in the Malay newspapers would bring in many more cases.

It remains, however, to be admitted, that we have not yet in leprosy the rapidity of treatment results that would enable us to cope easily with a large influx of patients.

During the year 151 cases were discharged, the disease being arrested and the patients free from any danger to the public. This compares favourably with the discharge of 91 cases in 1932. These cases have undergone three monthly clinical and bacteriological examinations before discharge. As a result of economic conditions a large number of these patients have been exceedingly reluctant to leave the Settlement.

Fifty-two cases absconded—the large majority of these returned after a short time. Two points require mention with regard to this. One is that no restrictive means of any importance are taken to prevent a patient absconding if he wants to. The other is that they are seldom if ever the result of patients wishing to flee into hiding or to “escape” in the accepted sense. They appear to be the result, as a rule, of urgent private affairs outside, which require personal attention—usually either debts or infidelities. The number who abscond and neither seek re-admission into this or any other Settlement is probably negligible. The figure compares favourably with the 74 abscondings of 1932.

The number of deaths has fallen from 61 in 1932 to 55 in 1933, in spite of the increased numbers—a death-rate of 36 per mille as against 45 per mille in 1932. A curious

feature, which I am unable to explain satisfactorily, is that the number of deaths fell from 40 in the the first half of the year to 15 in the second half.

#### SUMMARY OF STATISTICS.

1. The numbers have risen from 1,082 to 1,104. A treatment of 1,531 cases in all.
2. There has been an exceptionally large rise in the admission of Malays and women.
3. The death-rate and absconding rate have decreased : the discharge rate has increased.

The interpretation of the favourable trend seen in these statistics is, I think, definitely due to continued improvement in treatment.

It was felt at the end of 1932 that the intramuscular and intradermal injections of fresh Siamese ethyl esters represented the best method of treatment that Sungei Buloh could reasonably recommend to patients. In accordance with this all other methods of routine treatment were given up and the organisation of intramuscular and intradermal esters injections was developed for the majority of cases. The Settlement has then been divided medically into four main groups : (1) The majority of patients on intramuscular and intradermal esters. (2) A subsidiary group unsuitable for esters who receive Tai Foong Chee. (3) A hospital group for medical and surgical cases. (4) Experimental group.

*Intramuscular and Intradermal Ethyl Esters.*—With persistent propaganda, improved organisation and insistence on regularity this treatment has become both popular and effective. It is particularly gratifying to see more and more patients voluntarily asking to be subjected to the painful process of intradermal injections. The figures speak for themselves. In the first half of 1932, 26 patients were receiving injections of ethyl esters. By the end of 1932 there were 225. In 1933, 671 patients received full courses. This increase is a very gratifying one and can justifiably be correlated with the increased number of cases who have been discharged. For a full course a patient receives 40 injections, rising from 2 c.c. twice weekly to the maximum he can tolerate as judged clinically or by the sedimentation test. In 1933, 24,374 intramuscular injections have been given, an average of 720 injections a week during the treatment periods. This works out at an average of 36 injections per patient. During the first half of the year there were a number of cases of abscess formation due to injections from a faulty supply of esters. It is, however, a tribute both to

the leper dressers and to the good quality of the esters that in the second half of the year with over 16,000 injections there was no single case of abscess due to injection.

In an increasing proportion of cases the larger doses of ethyl esters have been given subcutaneously instead of intramuscularly, in order to save induration of the routine round of alternate deltoid and gluteal injections. Absorption seems fairly rapid, and there is on the whole less pain. Strict asepsis is of course essential.

*Intradermal Esters.*—A total of 199 cases received combined intramuscular and intradermal injections. The total number of areas injected has been 2,169. These figures are still too low but they are nearly double the 1932 figures, and the year 1934 starts with a still increased number. In spite of the painful and tedious nature of this treatment it is growingly popular and in our experience represents by far the best form of treatment available. Cases treated with intradermal esters show over 80% local improvement. As a result of esters treatment generally 587 cases out of a total of 671 show varying degrees of improvement—85%. Fifty-three cases, or 8%, showed no change. Thirty-one, or 4½%, were worse. No case was given esters during the period of or for a month after lepra reaction. In non-reaction cases with erythematous raised lesions of under twelve months duration we have obtained no improvement with esters treatment.

*Tai Foong Chee.*—The year began with 393 cases on Tai Foong Chee. The number fell during the year to 126, and its use is restricted to advanced non-resisting cases. There is some evidence that this drug helps to check the advance in such cases towards the mutilation of advanced phases of the disease. Advanced cases believe in it and apparently derive a certain amount of comfort from its administration in spite of the gastro-intestinal irritation that may follow from prolonged dosage. Our policy is now to confine the administration of Tai Foong Chee to intractable cases and to those who are too senile or advanced for energetic treatment. Out of 252 cases who had uninterrupted courses of Tai Foong Chee, 218 claimed varying degrees of improvement. Six or 2.4% showed no change. Twenty-eight or 11.2% were worse. These statistics on Tai Foong Chee require careful sifting. Few advanced cases among the Chinese in Sungei Buloh will admit that they are getting worse. In other cases where there is little possibility of ultimate arrest patients naturally prefer the easiest drug. For a number of other reasons the process of wish-fulfilment

seems to influence the patients' views on Tai Foong Chee more than any other drug.

*Alepol.*—There have been no cases treated with Alepol during the year.

*Hospital Patients.*—A total of 719 cases were treated in hospital as in-patients for complicating medical and surgical conditions and for the acute phases of leprosy. There were 558 males and 161 females. These numbers give a good idea of how large a percentage of lepers require hospital investigation and treatment at one period or another of their disease.

*Septic Conditions.*—Of the hospital patients, 209 were admitted for leprotic and trophic ulceration, gangrene necrosis of bone and septicæmia. A regrettable feature in the year's work is that there have been nine deaths among these septic cases. This figure is too high and it will be lowered in 1934. There were sixteen cases of severe nephritis with symptoms of chronic uræmia. Treatment of this condition forms one of the bugbears of leprosy work here. There were 11 deaths. Out of 17 cases of pulmonary tuberculosis, 11 died. A minor outbreak of malaria occurred in January and February with a sharper one in August—26 cases. Figures for previous years are based on calculations made when microscopic diagnosis and the differentiation between malaria and lepra reaction were imperfectly developed. It is not easy to tell, therefore, whether this malaria is likely to be an isolated incident or not. Out of a total of 68 cases during the year, there was one death in the case of an old man with a subtertian infection and coincident nephritis. Every case was treated in hospital and all with one exception (the fatal case) were treated either with atebrin or atebrin and plasmoquine. The results were satisfactory. In 10 cases a mild form of lepra reaction developed a few days after cessation of treatment with atebrin, but this may equally have been caused by the lowering of resistance due to the malaria. We have come to the conclusion, therefore, that leprosy is no contra-indication to treatment with atebrin or plasmochine. No effect on leprotic lesions was observed by the exhibition of either of these drugs.

*Lepra Reaction.*—A total of 197 cases were treated in hospital. Lepra reaction is on the increase here due to the increased treatment which appears to induce this condition. The cases have tended to fall into two main groups: (1) An acute exacerbation of leprosy with the appearance of raised spreading erythematous lesions accompanied by low fever.

(2) A febrile eruptive type commencing often with localised nerve pains and going on to fever and a rose spot eruption.

*Out-Patients.*—A clinic for ambulatory patients within the Settlement has been conducted daily and minor maladies attended to. The clinic has become increasingly popular—an average of 10—70 patients attending daily.

*Surgical.*—Fourteen major operations were performed—10 amputations, two laparotomies, and two appendectomies. All the amputations were conducted under spinal anæsthesia and there were no untoward effects. We had previously found the administration of a general anæsthetic to be a considerable strain on the metabolism of a leper, and the cases this year are evidence that spinal anæsthesia is the method of choice wherever practicable in a leper settlement. There were 808 minor operations—abscesses, circumcisions, and the like. Besides this there were 4,400 scrapings of ulcers, 3,300 minor operations for removal of dead tissue, and 2,600 for removal of necrotic bone. This makes a formidable total of 11,108 minor surgical events, or over 38 for each working day of the year. The figures give sufficient indication of the amount of time, energy, and surgical material that require to be expended in thwarting the constant tendency to advancing and repulsive open sores. A number of attempts were made during the year to deal with the problem by trying to devise a cheap form of strapping which could remain in position for a week, thus saving the time and material required for seven dressings. Thirty-five cases were dressed with a latex paste, the dressing being retained for five to seven days. The results were promising, but it was found impossible to contrive a paste that was cheap, effective and easy to handle. A further twenty cases were dressed with a solution of resin in spirit with the addition of a little glycerine and zinc oxide. The results were again promising but the paste was still unsatisfactory and in practice exceedingly messy. The production of a cheap, effective waterproof paste would achieve a considerable saving in surgical material. We have found elastoplast and similar preparations expensive and not so effective even as our locally made pastes. When it is remembered that some 300 dressings are done daily the problem from the financial point of view alone is worth investigation.

*Deaths.*—There were 55 deaths and 44 post-mortems. There were no deaths from leprosy. There were two suicides—both Chinese patients. One was a middle-aged man of weak mentality, the other a schoolboy of about thirteen who was bacteriologically negative and was to have been dis-

charged shortly. To the staff and myself he had appeared to be perfectly happy and I can only conclude that disturbances connected with the onset of puberty were responsible.

*Births.*—There have been seven births with six deaths. These children have been removed to the General Hospital within ten days of birth. The death-rate is very high, due to an outbreak of green diarrhoea among the children. These children appear to have little or no natural resistance during the first six months of life. I consider it likely, with the increase both in total numbers and in the percentage of early cases, that the birth-rate will increase in the Settlement.

#### SUMMARY OF MEDICAL AND SURGICAL STATISTICS.

671 patients received full course of intramuscular ethyl esters and another 199 received intradermal injections as well.

393 received courses of Tai Foong Chee.

197 cases of lepra reaction were treated and some original studies of the conditions made.

14 major and 808 minor operations were performed.

The treatment of minor septic conditions forms a very large part of the work in the Settlement.

The death-rate is 36 per mille as compared with 45 per mille for 1932.

#### EXPERIMENTAL WORK.

(1) *Dyes.*—The work on aniline dyes has been continued and a number of difficulties overcome. By the beginning of 1933 it had been observed that certain dyes injected intravenously appeared to have an effect on the leprotic process in a percentage of cases. Later observations showed (a) a definite tendency for these cases to relapse, and (b) a lesser relapse rate in those treated with fluorescein. Further experiments seemed to show that different brands of fluorescein varied in their therapeutic effect. A series of cases of lepra reaction showed 20% favourable results with the use of Merck's fluorescein, while a similar series showed over 70% good results with fluorescein made by Gurr & Coy.

An experiment was then made by putting three batches of patients on to injections of fluorescein from Gurr & Coy., British Drug Houses, and Dakin respectively. This experiment failed, however, to show a demonstrable difference in the quality of these samples. We were able, however, through this experiment, to form the following opinions :—

1. That fluorescein given intravenously in 20 c.c. doses of a 2% solution twice weekly seems to have a beneficial effect in about 50% of cases.

2. That the treatment appears to be useless in the majority of advanced cases of leprosy.
3. That the optimum period of treatment is about six weeks. After that few patients seem to benefit and a number seem to relapse again if treatment is continued.

Following this a number of experiments have been made with fluorescein derivatives, such as eosin and erythrosin. A further series of cases were treated by injections of fluorescein and then exposed to sunlight and a number of others by injections of fluorescein to which other drugs were added—alkalis, acids, calcium, and pot. permanganate. None of these gave any significant indication of a fresh avenue. As fluorescein is an anhydride of resorcin and pythalic acid, a further series of cases were then treated with resorcin. This presented considerable difficulties in actual practice and nothing of clinical promise was obtained. To avoid the toxic effects of resorcin I prepared a dye, resorcin blue, made by heating resorcin with sodium nitrite and purifying the resultant blue solution. This was water soluble and appeared to be well tolerated. Ten patients were given 25 c.c. doses of a 2% solution intravenously for five weeks. At the end of that time no change was found in the lesions and the experiment was stopped.

(2) A series of fifteen cases are now being treated by intravenous injections of phthalic acid, the remaining component of fluorescein. It is too early to form an opinion on the effects of this drug, but so far the effects are of definite interest and justify the continued close observation of these cases.

(3) *Thallium Acetate*.—Eight cases were treated with thallium acetate, four resistant ringworm cases and four for observation of its effects on leprosy. The ringworm results were satisfactory. No change was observed in the leprotic lesions.

(4) *Electric Vibro Massage*.—This has been used throughout the year for the treatment of post-reaction pains and as a means of inunction on special skin cases. It is a popular treatment and seems satisfactory.

(5) Seven cases of herpes were treated with intramuscular injections of cylophyllum oil every second day in 2 c.c. doses. In five of these the pain seemed to be definitely relieved—particularly so in a case of herpes occipitalis with severe pain and tenderness. Cylophyllum oil does not appear to act as a general narcotic and we have not observed any effect on pain of septic origin. Cases of leprosy with



neural pain, however, have responded well throughout the year.

(6) A study of the relative prevalence of positive nasal smears has been undertaken. Of 2,000 examinations of which we have accurate records :—

Nose and ear were both positive in 40.8%.

“ “ “ negative in 44.8%.

Nose was negative, ear positive in 11.3%.

Nose was positive, ear negative in 3%.

In 44.8% of cases the diagnosis was purely clinical. In only 3% of early cases was the nasal smear positive. The suggestion is that examinations of nasal smears are much less important than they are generally considered to be.

(7) *Microscopic*.—Viamein modifications of the Zeil Neelsen stain (using a background of  $\frac{1}{8}$ – $\frac{1}{4}$ ). Trypaflavine was tried with 50 positive smears. The lepra bacilli appear the ordinary fuchsin colour but against a yellow background. The method might be useful for demonstrating purposes but otherwise we did not consider it to be of benefit.

(8) Aoki and Aoki's method of distinguishing dead from living bacilli by staining with erythron picric acid and counterstaining with alkaline methylene blue was tried in a number of cases. The difficulty lies in the lack of any control means of telling whether a lepra bacillus is alive or dead. The results were indefinite.

(9) Over 200 differential counts of blood leucocytes have been done mainly in cases of lepra reaction. Lepra reaction is, however, so often accompanied by ulceration and other conditions which would effect leucocyte count that no definite conclusions were drawn.

(10) Defibrinated thick films from the circulating blood of cases of lepra reaction have been examined for lepra bacilli. 321 films have been examined and bacilli found in 51% of cases. These bacilli were quite often inside the large lymphocytes.

(11) Seven guinea-pigs have been inoculated with sputum from doubtful cases of pulmonary tuberculosis. Three guinea-pigs died of tuberculosis. Three other guinea-pigs have been injected with dyes and other drugs before injecting patients. These three remained healthy.

(12) In the first half of the year an effort was made to estimate the blood fibrinogen in varying stages of leprosy. Twenty-five cases were examined. In practice we found considerable difficulty in getting sharp readings of the

precipitates and it was not possible to prove the general impression we obtained—that the blood of an advanced leper clotted more quickly.

(13) The blood of 26 patients was examined for their diastatic enzyme content, and 38 examinations of blood were made in all. Eight advanced cases failed to show an enzyme content—the early cases were positive in varying degrees to diastase. The experiment was, however, inconclusive.

(14) In the leprosy work of other countries throughout the year there has been an increasing interest taken in serological reactions. A number of both lepers and non-lepers were subjected to Mitsuda's skin test. This consists of raising an intradermal weal by the injection of a sterilised vaccine made from a nodule. Early cases and non-lepers are supposed to give a positive reaction, while nodular cases give a negative one. The test, like others of its kind, would only be of value in classification or as an indication of resistance. Thirty non-leper inmates of the Decrepit Settlement were positive (i.e., were not lepers). One of these only became positive after three weeks. As it was perfectly obvious clinically that they were not lepers, the information obtained was not considered to be of great value. Leper controls showed the most varying results which could not be systematised.

(15) Following the work done by Dr. Kingsbury in 1932, a number of reaction cases were treated with injection of autogenous urinary proteose. This proteose is injected intradermally in a single weal in a starting dilution of 1–10,000,000. Ten patients were treated by weekly injections. Two of these developed lepra reaction. A third, a case of asthma, apparently has cleared up completely after two injections. A fourth case of severe and prolonged nerve pains who had been confined to bed for over three months, was greatly relieved after one injection and was able to walk about without pain after the second. The other six were cases of lepra reaction, and showed no definite response. Further work is being done on this.

*Syphilis*.—A total of 162 cases were given anti-syphilitic treatment. In a previous report it was stated that more and more reliance was being placed in the administration of bismuth owing to the number of cases who were reacting badly to the injection of arsenicals. It has been found this year, however, that the bad effects have disappeared on a rigid revisal of technique. Ambulatory cases have been given normal courses of N.A.B. and Bismustab ; hospita

cases have, in suitable subjects, been given two injections of N.A.B. weekly, making a total of .9 gram each week with additional injections of Bismuth. These would appear to be very large doses for cases with impairment of skin function, but they are apparently quite well tolerated if a scrupulous technique is followed.

*Leprosy of the Eye.*—Fourteen cases with leprotic affections of the eyes were treated with Solganol Oleosum. Leprotic iritis appears to respond very well to the treatment. Twelve cases with eye involvement (three iritis and nine with chronic conjunctivitis or with "leprous eye") were treated with subconjunctival injections of 1—1,000 trypan blue. This was done following the work of Muir, who claims very good results. The injection is an unpleasant one. The cases with chronic conjunctivitis appeared to benefit and also a percentage of eye reactions. In a number of cases in each group no improvement was observed.

*Administrative.*—Conditions within the Settlement continue to be in a very satisfactory state. An English play was prepared by the leper children and performed during the middle of the year before an outside audience of about 100 visitors. This has been our most ambitious social effort so far and was, I think, good propaganda for the attraction of cases to the Settlement. The Settlement magazine, the periodical dramas and cinemas have gone on as usual. The 150 cases discharged have raised a number of problems. These patients are as a rule reluctant to leave the Settlement during the present economic depression. The only patients willing to be discharged are those Indians who have relatives in India or who are unable to realise that there is a slump. Another group are handicapped by physical disabilities which prevent them pulling their economic weight or which suggest leprosy to any prospective employer. In the half-yearly report I quoted a case from this group—the case of a young Chinese woman who was discharged. Her appearance was reasonably attractive except that the fingers of both hands had been lost. She could not, therefore, return to her previous occupation as a dhobie, and the number of professions open to her appear to me to be strictly limited. Such a case, from the nature of her future methods of earning a livelihood, must be prone to relapse and the dissemination of leprosy. Patients are to a much greater extent visualising their stay in the Settlement as a temporary one. A probably unique example is that of a Government Department who sent in a Malay employee during the year under the regulations for local

sick leave. The Settlement is obviously attracting more and more early cases, especially among the Malays and Chinese, and the year has shown increased reason to hope that the machinery of compulsion is steadily becoming a smaller factor in the segregation and treatment of these cases.

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