

Leprosy in the Federated Malay States

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BEING AN EXTRACT OF THE ANNUAL REPORT, 1932, ON
THE FEDERAL LEPROSY SETTLEMENT, SUNGEI BULOH.

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Straits Settlements).*

THIS institution which houses, controls and treats a large proportion of the cases of leprosy of Malaya is probably the largest treatment centre in the British Empire.

Malaya has a population of nearly $4\frac{1}{2}$ million of whom 1,700,000 are Chinese and over 620,000 are Indians. Malays number 1,644,000. The Indians and Chinese are to a great extent non-settling immigrants and the great majority of the leprosy in Malaya is found among the non-Malaysian population.

Maximum shade temperature in Malaya is rarely over 97° . Humidity is consistently high throughout the year—90%. Seasonal variations are mild and the rainfall is abundant and well distributed throughout the year. Vegetation and jungle growth are luxuriant. The principal occupations—agriculture and the rubber and tin industries—have up to recently provided a comparatively high scale of living.

The Legal Enactment relating to leprosy requires every case to be in a state of isolation either privately or under Government supervision. Segregation is carried out fairly strictly and the majority of obvious cases are probably segregated.

The Federal Leprosy Settlement, Sungei Buloh, was supervised by Dr. A. G. Badenoch from the beginning of the year till 27th April, 1932, when Dr. G. A. Ryrie returned from leave. Three months study leave was spent by Dr. G. A. Ryrie in studying methods and conditions of leprosy work in India. On 10th August Miss E. M. Goulding was appointed Matron. Mr. W. N. Woodford, Hospital Assistant, Grade I, retired from the service at the end of the year.

Numbers.—The year began with 996 inmates and ended with 1082. There were 353 admissions, the largest number in the history of this or the old settlement.

MEDICAL WORK.

(1) *Nursing.*—A very definite advance in the nursing

ward management and out-patient organisation has been effected by the provision of a matron. The women's ward has been re-organised under proper nursing conditions. The inmate-dressers receive lectures in nursing, medicine, hygiene and leprosy, and the result is that every educated patient who is fit to work is now undertaking volunteer duty of one kind or another. This increased supervision and improvement in atmosphere has made it possible to effect a number of economies without opposition or grumbling. Minor ailments of the children, of whom there are about 80, are now dealt with and the children are medically inspected weekly. The advent of a matron has also made possible the study of the relation between minor gynaecological disorders and the spread of leprosy. At present data are being gathered for a consideration of the effect of menstruation on the febrile aspect of leprosy.

A greater supervision of drugs, dhobie work, etc. ; and an elimination of a certain amount of waste has been effected. The improvement in nursing has led to a perceptible lowering of the death rate.

(2) *Leprotic Treatment.*

(a) *Alepol.*—79 cases were given courses of alepol throughout the year. The average number of injections was 35 per patient given intravenously in doses up to 5 c.c. twice weekly. None of the cases seemed to get a great deal of benefit and 62% showed either no change or were worse. Intravenous injections of alepol are therefore not being continued.

(b) *Tai Foong Chi.*—Much of the popularity of this drug is due to the fact that it is not an injection. It appears to act by the induction of a mild reaction. About 350 patients have received courses of Tai Foong Chi throughout the year. 40% of cases either show no improvement or are worse, 60% either claim that they are better or are observed to have improved. Tai Foong Chi does not appear to be a safe drug to administer in early cases as there is a definite risk of inducing a more rapid spread of leprosy. Later and more indurated cases appear to be prevented from getting worse as a rule.

(c) *Esters.*—The number of cases on esters was increased from 26 in the first half of the year to 225 in the second half. This still represents a lower percentage of patients on esters than is desirable. 62% show improvement on six months treatment. 78 cases received intradermal esters. This number again could be greatly increased with benefit. 89% of these cases show at least

local improvement and a greater extension of this treatment combined with intramuscular esters is indicated.

Treatment in all these cases has been given for 5 months per half-year with one month's rest for assessment and re-examination of cases.

Of an average of 1,000 patients, 683 have been treated by one or other of the above stated treatments. The remainder include hospital and experimental cases together with a number too old or decrepit to benefit by treatment.

Hospital.—551 cases were treated in hospital. Roughly half these cases were diseases due directly to leprosy, the other half being general, medical or surgical cases.

Leprosy Cases.—140 cases of lepra reaction were admitted as being sufficiently severe to require hospital treatment. There were no deaths. In 1930 sixty-five cases of lepra reaction were treated. The increase in number is largely to be accounted for by the increased faith of the patients in the hospital and in the new methods of treatment.

Treatment of reaction has been greatly developed throughout the year in the following ways :—

Mercurochrome.—220 Soluble was used for a number of cases. This drug has already been used in India with very good effect. We have given this drug intravenously in doses of 5—10 c.c. of a 2% solution. The effect in reaction is often striking.

The Pharmaceutical Chemist, Selangor, supplied us during the year with locally made calcium glucinate in bottles ready for intravenous injections. This has proved of great benefit. 10—20 c.c. of the solution are injected intravenously. This treatment is sufficient by itself to control milder cases of reaction and in severer cases is a most valuable adjuvant to treatment by eosin or fluorescein. It causes less disturbance to the patient than intravenous calcium chloride. Calcium chloride injected intravenously causes intense irritation and sloughing of tissues if there is any leakage : calcium glucinate is non-irritating.

Calophyllum Oil.—Esters of this oil were obtained in 1930 from Fiji and were tried out with success in a number of cases of nerve pains and "nerve reactions." We have found (a) that this is an oil commonly used locally by Indians under the name of Vepenny oil, (b) that the purified oil injected intramuscularly is just as effective as the esters, (c) that its effect on nerve pains is just as marked in most cases as that of ephedrine, while the relief induced by

the oil is more lasting, (d) three cases of herpes zoster showed improvement after injection of 3 c.c. into the sacrospinalis muscle.

The above methods have given us a very much more satisfactory control over the pain and distress associated with the acuter phases of leprosy. Experiments along these lines are still continuing.

DEATHS.

There have been 61 deaths, which is 5.6% of the total inmates. Post mortems in the second half of the year showed that every advanced case of leprosy had chronic nephritis.

LABORATORY WORK.

2,843 microscopic examinations of skin smears were done in 1932 as compared with 1,108 in 1931. In addition a number of sections of bioptic and post mortem material were made and also examinations of films from defibrinated circulating blood, etc. A number of alternative staining methods have been experimented with: none of these have so far proved of value.

EXPERIMENTAL WORK.

Some of this has been described under the treatment of reaction.

A number of tentative experiments were made throughout the year with Chinese and Malay remedies but no indication was obtained of any possible avenue of treatment. An attempt was made to desensitise two cases by injecting increasing doses of serum from a reaction case. A number of drugs were injected intradermally in selected cases and compared with controls on intradermal esters. One or two patients were put on ketone diet, high sugar diet, etc.: none of these experiments proved of value. A great deal of experimental work and clinical research has been done which will shortly be published.

DENTAL.

400 dental operations have been carried out. The clinic has proved of definite benefit in controlling the minor debilities which encourage the spread of leprotic lesions.

ANTI-SYPHILITIC.

Two difficulties have confronted us throughout the year: (1) that leprosy patients with much involvement of the skin do not tolerate large doses of arsenicals or bismuth; (2) that of 690 patients 43.48% have both Wassermann and Kahn reactions positive. It is difficult to believe that nearly half of the cases here have active syphilis. The

present tendency among leprologists, however, is towards the view that the Kahn test is not influenced by leprosy. The situation is, therefore, obscure. Selected cases with a history of chancre or clinical evidence of syphilis have, therefore, been treated. 247 cases were given partial or complete courses during the year. The results are not yet ready for consideration.

DISCHARGES.

91 cases have been discharged throughout the year as being free from danger to the public. These cases were kept for a minimum of six months under observation before release. In every case at least three microscopic and two clinical examinations were made before the six months probation.

SOCIAL.

During the year a Women's Club and an Indian Club have been opened and an attempt made to stimulate the playing of games. Vegetable gardens and piggeries have increased and there has been a much greater development of flower gardens. Subscriptions to the Lepers' Aid Fund have decreased owing to the slump, but public interest in the settlement appears to have increased as there have been a very large number of visitors. The usual social activities—sports, cinema shows, dramatic entertainments, etc., have been carried on.

There is a good deal less cynicism about treatment and a more hopeful atmosphere generally.

APPENDIX B.

RETURN OF ADMISSIONS AND CASUALTIES BY RACES.

Nationality.	Patients remained on 31/12/31	New Cases admitted during 1932.	Readmissions during 1932, <i>i e.</i> , patient's return.	Total cases treated.	Discharged	Transferred etc.	Died.	Patients remaining on 31/12/32
Chinese	789	219	37	1045	44	78	51	872
Indians	187	64	20	271	43	34	9	185
Javanese	7	1	—	8	—	—	—	8
Malays	6	7	2	15	1	2	—	12
Eurasians	5	1	1	7	1	1	1	4
Japanese	1	—	—	1	1	—	—	—
European	—	1	—	1	—	—	—	1
Others	1	—	—	1	—	—	—	—
	996	293	60	1349	91	115	61	1082

APPENDIX I.

ANNUAL REPORT, FEDERAL LEPROSY SETTLEMENT, 1932.

REPORT ON ROUTINE ANTI-LEPROTIC TREATMENTS.

The year is divided into two administration periods, the first of which has already been generally reported on. The scheme of treatment courses is shown by the diagram below. Four or five months are devoted to active treatment of leprosy, the remainder of the half-year allows the patient a short rest from the strain of attendance at dispensary, etc. (regularity in which is otherwise insisted upon). During this rest period the patient received general tonics p.r.n., while the staff gathered data for the report.

2. This permits of roughly 200 doses of Tai Foong Chi (*vide infra*) in each half-yearly course, or a minimum of 40 (bi-weekly) intramuscular injections of iodised esters; or 20 treatments with intradermal esters.

3. Notes on the leprotic manifestations in each case have so far been made by writing a verbal description. The coming year opens with the institution of somewhat elaborate charts in which lesions are graphically represented so as to make one's conclusions less liable to error.

4. The report is divided into four parts dealing with the four standard treatments, viz. :—

- i. Alepol intravenously.
- ii. Tai Foong Chi by the mouth.
- iii. Intramuscular Esters.
- iv. Intradermal Esters.

Percentages, intended as a rough guide only, are given to the nearest integer where the figures warrant them.

Patients are selected for such of these treatments as their clinical history and conditions combine to indicate.

5. It will be noted that intravenous injections of alepol were discontinued during the second half of the year, for reason which appears in the tables. Oral administration was reported on favourably in 1931, but a sufficient supply for continuing this treatment has not yet been obtained.

6. The findings of improvement or the reverse are based upon consideration of the following :—

- (1) Change in physical characters of lesions (taking bacteriological examinations into consideration);
- (2) Changes in sensation;
- (3) Nerve-pulling and allied symptoms;
- (4) Progress of ulcers;
- (5) The patient's own statement in the matter, supported by weight, chart, etc.

It is obvious, therefore, that one's judgment is formed mainly on clinical grounds. This is beset by the usual fallacies and perhaps also by some fallacies peculiar to leprosy work. But no other standard is available, the purely bacteriological being manifestly misleading.

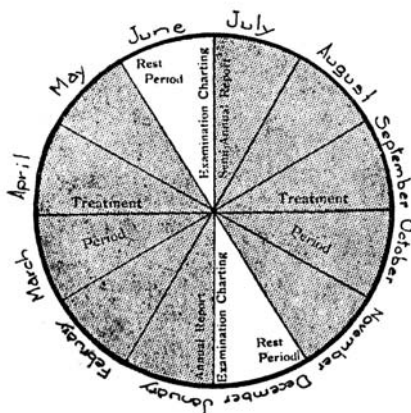


Diagram to show courses of treatment.

PART I.—TREATMENT WITH ALEPOL.

The usual route is the intravenous. In a few cases of difficulty the dose was given intramuscularly.

Formula: Phenol: 18 minims.

Alepol (sodium hydncarpate): 210 grains.

Distilled water: 16 fluid ounces.

i.e., a 3% solution.

Dose: 1—5 c.c. intravenously, twice weekly.

The average number of injections given was 35.

Much improved.		Improved.		No Change.		Worse.		Much Worse.		Total Cases.
Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
0	0	30	38	42	53	6	8	1	1	79

These results, as will be seen later, are the poorest of the series of treatments reported on.

PART II.—TREATMENT WITH TAI FOONG CHI.

Formula: Freshly ground seeds of hydncarpus fruit: 2 drachms.

Freshly ground flower-tops of *cannabis indica*: 1 drachm.

Sodium bicarbonate: 10 grains.

Mix well, and administer while fresh.

The above dose is given twice daily. Course lasts four months, with an interval of two weeks in the middle. Patients receive dose according to age and tolerance. Half-doses are frequent. Regularity is insisted upon.

A.—REVIEW OF THE YEAR 1932 (TAI FOONG CHI).

	Much improved.		Improved.		Stationary.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
1st half-year	16	5	188	55	125	36	13	4	1	.3	343
2nd half-year	7	2	223	59	129	34	20	6	—	—	379
TOTAL											722

The traditional and present popularity of this treatment and its ease of administration from the patient's point of view, taken together with the above results, make it one to be retained.

TREATMENT WITH TAI FOONG CHI.

B.—RESULTS BY LEPROSY GROUPS. 2ND HALF-YEAR ONLY.

	Much improved.		Improved.		Stationary.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
N1	—	—	1	—	1	—	1	—	—	—	3
N2	—	—	1	—	1	—	—	—	—	—	2
N3	—	—	1	—	—	—	—	—	—	—	1
C1 N1	1	—	56	64	20	23	10	11	—	—	87
C1 N2	1	—	29	66	13	29	1	—	—	—	44
C1 N3	1	—	14	56	10	40	—	—	—	—	25
C2 N1	2	—	48	58	29	35	3	7	—	—	82
C2 N2	—	—	33	62	17	32	3	6	—	—	53
C2 N3	—	—	12	50	12	50	—	—	—	—	24
C3 N1	1	—	10	47	9	43	1	—	—	—	21
C3 N2	1	—	12	44	13	48	1	—	—	—	27
C3 N3	—	—	6	60	4	40	—	—	—	—	10
All groups	7	2	223	59	129	34	20	50	—	—	379

Conclusion.—The percentage showing improvement remains fairly constant or all groups, with a tendency to fall in the more advanced groups.

Early groups (C1 N1) show the biggest proportion of *worse* cases.

TREATMENT WITH TAI FOONG CHI.

C.—BY AGES.

	Much improved.		Improved.		Stationary.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
10—20	1	—	40	77	11	21	—	—	—	—	52
20—30	—	—	48	64	20	27	7	9	—	—	75
30—40	2	—	54	57	35	37	3	—	—	—	94
40—50	3	—	40	58	20	29	6	8	—	—	69
50—60	1	—	32	56	23	40	1	—	—	—	57
60—70	—	—	9	28	20	94	3	9	—	—	32
All ages	7	2	223	59	129	34	20	6	—	—	379

Comment.—A definite falling off in response to treatment in old age, with a tendency to remaining stationary, is what one expects in most chronic diseases.

TREATMENT WITH TAI FOONG CHI.

D.—RESULTS IN EARLY GROUPS, BY RACES. 2ND HALF-YEAR ONLY.

(N1, C1 N1, C2 N1, C1 N2).

	Chinese.		Indians.		Javanese.		Malays.		Total
	Cases	%	Cases	%	Cases	%	Cases	%	
Much imprvd.	3	2	1	4	—	—	—	—	4
Improved	113	60	20	74	—	—	—	—	134
Stationary	57	30	4	15	—	—	—	—	63
Worse	13	7	2	7	—	—	—	—	15
TOTAL	186		27						

Conclusion.—It would appear that, in the earlier and less severe phases of leprosy, Indians respond rather better than Chinese to this form of treatment.

PART III.—TREATMENT BY INTRAMUSCULAR INJECTIONS OF IODISED MIXED ETHYL ESTERS OF THE OIL OF HYDROCARPUS ANTHELMINTICA.

Formula—Mixed esters: 100 c.c.

Iodine: .5 gramme (approx.).

From 1 to 5 c.c. (in rare cases up to 10 c.c.) are injected twice weekly, according to age and tolerance.

Course lasts four months or more. The average number of injections given was about 30.

This was considered the treatment of election for early cases, whose numbers therefore preponderate.

A.—REVIEW OF THE YEAR (INTRAMUSCULAR ESTERS).

	Much improved.		Improved.		Stationary.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
1st half-year	5	19	12	46	8	31	1	4	—	—	26
2nd half-year	19	8		54	64	28	18	8	1	.5	225
Total of courses of treatment given during the year											251

Comment.—The results of the first half-year were encouraging. The treatment was pushed during the second half-year.

TREATMENT WITH INTRAMUSCULAR ESTERS. 2ND HALF-YEAR ONLY.

B.—RESULTS BY LEPROSY GROUPS.

	Much improved.		Improved.		Stationary.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
N1	—	—	2	—	—	—	—	—	—	—	2
N2	—	—	2	—	—	—	—	—	—	—	2
N3	—	—	—	—	1	—	1	—	—	—	2
C1 N1	6	7	41	48	29	34	8	9	1	—	85
C1 N2	3	8	21	60	7	20	4	11	—	—	35
C1 N3	1	8	8	66	3	25	—	—	—	—	12
C2 N1	5	8	33	56	17	28	4	7	—	—	59
C2 N2	1	7	10	71	3	21	—	—	—	—	14
C2 N3	—	—	2	—	2	—	—	—	—	—	4
C3 N1	2	33	2	33	2	33	—	—	—	—	6
C3 N2	1	—	2	—	—	—	1	—	—	—	4
C3 N3	—	—	—	—	—	—	—	—	—	—	—
All groups	19	8	123	54	64	28	18	8	1	.5	225

Note.—On the whole, the earlier cases have been selected for this form of treatment.

Conclusion.—The percentage showing improvement remains fairly constant for all groups.

TREATMENT WITH INTRAMUSCULAR ESTERS.

C.—RESULTS BY AGE GROUPS.

2ND HALF-YEAR ONLY.

Age	Much improved.		Improved.		No change.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
10—20	2	6	17	47	15	42	2	6	—	—	36
21—30	10	14	37	51	22	30	3	4	—	—	72
31—40	3	5	39	65	10	16	7	11	1	—	60
41—50	4	12	18	55	6	18	5	15	—	—	33
51—60	—	—	11	52	9	43	1	5	—	—	21
61—70	—	—	1	33	2	66	—	—	—	—	3

Conclusion.—Age groups show little differences, except for a falling off in response in old age.

TREATMENT WITH INTRAMUSCULAR ESTERS.

D.—RESULTS IN EARLY GROUPS, BY RACES.

2ND HALF-YEAR ONLY.

(N1, C1 N1, C2 N1, C1 N2).

	Chinese.		Indians.		Malays.		Javanese.		Total
	Cases	%	Cases	%	Cases	%	Cases	%	
Much imprvd.	8	7	6	11	—	—	—	—	14
Improved	70	56	25	47	1	—	1	—	97
Stationary	37	29	14	26	1	—	1	—	53
Worse	9	7	7	13	—	—	—	—	16
Much worse	—	—	1	—	—	—	—	—	1
TOTAL	124	—	53	—	2	—	2	—	—

Conclusions.—There appears to be little difference between Indians and Chinese, in the early and less severe phases of leprosy, in their response to this form of treatment. The proportion becoming worse is rather high, as previously noted in early cases. This is more marked among Indians than among Chinese.

SUMMARY OF ROUTINE TREATMENTS, I—III.

From observations made at the end of the year, results are as follow :—

Treatment.	Much improved.		Improved.		Stationary.		Worse.		Much worse.		Total Cases.
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
I. Alepol	—	—	30	38	42	53	6	8	1	1	79
II. Tai Foong Chi	7	2	223	59	129	34	20	6	—	—	379
III. Intramuscular Esters	19	8	123	54	64	28	18	8	1	.5	225
TOTAL	26	4	376	55	235	35	44	7	2	—	683

Conclusions.—(1) Alepol to be dropped. (2) Tai Foong Chi to be used in selected cases as before. (3) Intramuscular Esters, especially when combined with Intradermal Esters, to be the sheet anchor of treatment, especially in early cases.

TREATMENT WITH INTRADERMAL ESTERS.

SUMMARY OF RESULTS ACCORDING TO (i) NUMBER OF INJECTIONS GIVEN, & (ii) TYPE OF CASE.

	Number of injections given.						Type of Case (N1-3)			Total.	
	4	5—8	9—12	13—16	17—20	Over20	C1	C2	C3	Cases.	%
Much Improved	—	—	—	1	1	6	5	3	—	8	10
Improved ..	8	13	18	9	3	11	32	19	11	62	79
Stationary ..	1	1	—	—	1	1	2	2	—	4	5
Worse ..	—	—	1	—	—	1	1	1	—	2	3
Much worse ..	—	1	1	—	—	—	2	—	—	2	3
TOTAL ..	9	15	20	10	5	19	42	25	11	78	100

GENERAL SUMMARY OF PATIENTS.

Total receiving routine treatments I to III	...	...	683
Number receiving intradermal treatment	...	...	78
Number in experimental wards	...	...	92
Cases definitely unfit for anti-leprotic treatments	...	...	124
Cases whose treatment has been irregular for various reasons, usually intercurrent disease or intransigence			105
Total	...	...	1,082

Number of patients receiving active treatment for leprosy is therefore 853, a proportion of nearly 80 per cent.

APPENDIX II.

REPORT ON ANTI-SYPHILITIC TREATMENT.

As mentioned in the last Annual Report, batches of 50 cases were put on anti-syphilitic treatment.

Sulpharsenol was first used, but this drug occasionally gave toxic results; later cases were treated with other arsenicals, viz., Metarsenobillon and Novarsenobillon, and with Bismostab. The most recent tendency here has been towards accepting Bismostab as the sheet anchor in the treatment of leprosy syphilitics.

The usual course consisted of eight weekly injections in gradually increasing doses. A month after completion of this course, a second specimen of blood was submitted for W. and K. reactions.

A detailed investigation into the effect of treatment on the luetic reaction of over 200 patients is being undertaken.

A total of 690 specimens were submitted for examination during the year. The results were as follow:—

<i>Positive</i>	.. .. .	300
(Excluding a positive Wassermann reaction unsupported by a positive Kahn reaction.)		
<i>Negative</i>	.. .. .	390
(Including all other results).		<hr/>
		690
		<hr/>

This gives 43.48% of positives.

By the end of May, 1932, every case in the settlement has had his or her blood examined for these reactions at least once, so that, since then, specimens are being submitted only in the case of new admissions to the settlement or those who have finished a course of anti-luetic treatment, or for some special reason.

A total of 247 new cases were treated during the year. Of these 55 had not yet completed their treatment by the end of the year. A balance of 22 positive cases are yet to be put on treatment in the new year.

A total of 1,514 injections were given:—

Sulpharsenol	754
Metarsenobillon and Novarsenobillon	243
Bismostab	517
		<hr/>
		1514
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