Reprinted from the PHILIPPINE JOURNAL OF SCIENCE,
1931, vol. 44, No. 4, April, pp. 449-480.

REPORT OF THE LEONARD WOOD MEMORIAL CONFERENCE ON LEPROSY

HELD IN MANILA, PHILIPPINE ISLANDS, JANUARY 9 TO 23, 1931

CONTENTS

FOREWORD

It has long been evident to those engaged in the study and control of leprosy, that the existing terminology and classification of the subject permitted of widely divergent interpretations. This defect had become a handicap of such degree, in correlating the views and results of different leprologists, that an opportunity for discussion and attempted correction of some of the difficulties seemed to be an imperative requirement for progress.

During the past year both the Leonard Wood Memorial for the Eradication of Leprosy and the Leprosy Commission of the League of Nations took cognizance of the situation, and became interested in holding a round-table conference, in the Far East, and the trustees of the Memorial subsequently made a financial allotment to effect this purpose in so far as it was practicable. It was decided that the Conference should take place in Manila immediately after the meeting of the Leprosy Commission, which was held in Bangkok in December, 1930.

The number of leprologists invited to the Conference was necessarily limited since it was intended that the proceedings should be of the nature of informal discussions. It seemed especially desirable that those individuals who are members of the Leprosy Commission of the League of Nations, or their representatives, should attend because of their previous studies of the subject, and of their broad knowledge of the conditions prevailing in the widely scattered areas which are affected. Invitations were extended to a number of others who were located in the Far East, and whose experience was known to include unique aspects.

The Conference convened at Manila January 9, 1931, and was in session until January 23, 1931. Those who attended are as follows:

Dr. ET. BURNET, secretary, Leprosy Commission, League of Nations.
Dr. R. G. COCHRANE, secretary, British Empire Leprosy Relief Association.
Dr. H. I. COLE, chief chemist, Culion Leper Colony.
Dr. J. FAJARDO, director of health, Philippine Health Service.
Maj.-Gen. J. D. GRAHAM, I. M. S., public health commissioner, Government of India.
Dr. G. GUSHUE-TAYLOR, superintendent, Mackay Memorial Hospital, Taihoku, Formosa.
Dr. V. G. HEISER, director for the Far East, Rockefeller Foundation.
Dr. LEE S. HUIZENGA, superintendent, Mission Hospital, Jukao, Ku, China.
Dr. A. N. KINGSBURY, director, Research Institute, Kuala Lumpur, Federated Malay States.
Capt. P. H. J. LAMPE, director of health, Dutch Guiana.
Dr. C. B. LARA, chief physician, Culion Leper Colony.
Dr. J. LOWE, medical superintendent, Dichpali Leprosy Hospital, India.
Dr. J. L. MAXWELL, Henry Lester Institute of Medical Research, Shanghai.
Dr. E. MUIR, leprosy research worker, Calcutta School of Tropical Medicine.
Dr. E. E. NEFF, superintendent, Mogokai Central Leper Hospital, Fiji.
Prof. Dr. B. NOCHT, president, Leprosy Commission, League of Nations.
Dr. M. OTA, Tohoku Imperial University, Japan.
Dr. J. N. RODRIGUEZ, supervisor of leprosy-treatment stations, Philippine Health Service.
Dr. J. C. TULL, government pathologist, Singapore.
Dr. H. W. WADE, chief pathologist, Culion Leper Colony; and medical director, Leonard Wood Memorial.
Dr. N. E. WAYSON, director, United States Leprosy Investigation Station, Hawaii.
Drs. LEROY-DESBARRES and H. JOYEOUX, of French Indo-China, also participated in the first sessions.

The Conference was organized at the first meeting, and the agenda for consideration was agreed upon promptly thereafter. The subject matter was prepared for the most part in committee, presented to the plenary sessions, and final decisions reached in these. January 14, the members embarked on a journey of inspection of regional treatment stations and leprosaria at Cebu, Zamboanga, and Iloilo, and of the Culion Leper Colony. The sessions were continued with but brief intermissions throughout the tour, both on the steamer and at ports visited.

The discussions were frank and detailed, and were in most instances extended to a point of reconciliation of viewpoints and common agreement. The following report is that decided upon by the Conference in plenary sessions.

H. W. WADE,
Chairman of Conference.

G. GUSHUE-TAYLOR,
Secretary.

DISCUSSIONS AND CONCLUSIONS

I. THE INTERNATIONAL VIEWPOINT

An important cause of misunderstanding among leprosy workers is their insufficient appreciation of fundamental differences in conditions and practices existing in different regions. Leprosy has a wide range of manifestations and the predominating features, such as the frequency of one or another type, may vary widely in different regions. Local conditions of various kinds must determine the nature of antileprosy activities. The results of work may be influenced by such factors as the type of case, the degree of advancement of the disease, and the conditions under which the patient is observed. It is important that leprologists bear such factors in mind in order that they may precisely evaluate their own findings, particularly with regard to the work of others, and avoid the formulation of unduly broad conclusions.

Study tours.—It is deemed highly advisable that any country or institution undertaking serious work in leprosy should send some of its leading workers to one or more of the main centers of leprosy activities, in order to study the local conditions and the methods in use. The value of this lies not only in the knowledge acquired that can be applied directly to the visitor's own work, but also in the broadening of his outlook on the leprosy problem as a whole.

Transfer of workers.—It not infrequently happens that the results obtained by a worker or group in one country are not confirmed by those working in other countries. Whether this is due to peculiarities of conditions prevailing, or to the personal equation, or to other factors is usually not apparent. Progress toward the clarification of questions of regional differences could undoubtedly be accelerated were it possible for persons who have carried out studies in one region to be transferred to another in order to continue or repeat such studies there or to undertake correlative investigations. It is deemed desirable to bring the possibilities of such a plan to the notice of institutions and organizations concerned with the study of leprosy.

Leprosy digest, or annuaire.—It is unquestionably difficult for isolated workers to gain from the available literature an adequate understanding of conditions prevailing in other regions. There is need of a reference work of the nature of a comprehensive leprosy survey, or annuaire, which would afford a reasonably accurate summary of what is known of the leprosy situation in all parts of the

world. It should include information regarding the extent and distribution of the disease in the various countries or regions, the predominating types, other factors that affect leprosy work, and the laws and regulations obtaining; it should also include statements of activities, lists and brief descriptions of institutions, and perhaps data concerning active leprologists. The existing information of this nature is widely scattered and incomplete. It should be collected, summarized, amplified where necessary, and brought up-to-date. The preparation and periodical revision of such a survey would be a laborious and somewhat expensive task, hardly possible except through the agency of an organization such as the Leprosy Commission of the League of Nations or an association of leprologists. The matter should, however, be given serious consideration.

II. UNIFORMITY OF METHODS AND TERMS

Differences in terminology, in classification and subclassification of cases, in methods of examination and treatment, and in other features are felt to be a serious handicap to leprosy work in general. There is little possibility of arriving at uniformity of practice in certain features, notably the methods used in the general antileprosy campaign, but in other matters it should be feasible to arrive at some degree of standardization.

1. DESIGNATION OF CASES OF LEPROSY

It is confusing, when there is need of precision, if the term "case of leprosy" is applied indiscriminately to all types, from those that are active but with slight involvement, to those with marked mutilations but in which all evidence of activity has long since disappeared and only the permanent sequelae remain. Reports should be precise, indicating the types of cases, and the subtypes based on degree of advancement (see page 337); the proportions of each should also be stated. Unless this is done it is impossible to compare the results obtained in different institutions. There should, also, be uniformity in the use of other terms employed in designating cases of leprosy.

The term "suspected" case applies to a patient who presents clinical signs that are suggestive of leprosy but not sufficient for a definite diagnosis.

The term "clinical" case is sometimes applied to distinguish one that is diagnosed on clinical grounds, the bacteriological findings being negative.

The term "incipient" case is sometimes applied to an early or slight case in which the bacteriological findings are negative; this has been used where the "cutaneous" type greatly predominates and patients with bacteriologically positive findings are isolated.

Since the terms "clinical" and "incipient" are to a certain extent indefinite, it is preferable that whenever possible more specific terms be used (see page 335).

The term "infectious" case is much used, chiefly in connection with administrative measures. The use of this term is not recommended; attention is called to Administrative Classification of Cases, page 338.

The term "burned-out" case is often applied to arrested cases that show mutilations, contractures, etc. It is recommended that the use of this term be discontinued and that "arrested with deformity" be employed.

The term "leper" is felt to carry with it a definite social stigma. It is recommended that the use of this term be discontinued and that "case of leprosy" be employed.

2. DESIGNATION OF LESIONS

Leprosy may produce pathological changes in many tissues of the body. The nerves, skin and mucous membranes, eyes, bones, lymph glands, testes, and other organs may be affected. For present purposes, attention will be confined to those changes which most commonly produce characteristic clinical manifestations.

Lesions of peripheral nerves may produce thickening, local tenderness, and, rarely, abscess formation. The signs associated with nerve involvement tend to fall into two groups, namely: (1) The *macular,* which is characterized by disturbances of pigmentation, circulation, and sensation in circumscribed areas. (2) The *acroteric,* in which the changes occur in the extremities with a tendency to centripetal spread. These include alterations of sensation; trophic disturbances in the skin, bones, and muscles; and paralyses. The signs of both groups may coexist and either may predominate.

Changes in the skin may be functional, structural, and circulatory. Functional changes are hyperesthesia, hypoesthesia, paresthesia, anæsthesia, hyperhydrosis, anhydrosis. Structural changes are keratosis, hypopigmentation, hyperpigmentation, depilation, atrophy (parchment skin or crushed tissue-paper appearance), infiltration (thickening), suppuration, ulceration, (leprotic, trophic, trau-

matic), scarring. Circulatory changes are hyperemia, ischemia, œdema (circumscribed or diffused), bullæ.

DEFINITIONS

Leprotic.—It is suggested that the term "leprotic" be applied to those changes which present clinical or microscopic evidence of inflammatory processes, typically of granulomatous nature, which are apparently caused by *Mycobacterium leprae* in them. In such lesions the organism can usually be demonstrated by the ordinary methods of examination.

Leproma.—The term "leproma" is applied in a general sense to any lesion of a leprotic nature, as defined herein.

Ulcers.—In considering the ulcers of leprosy, distinction is not always made between those which occur in leprotic lesions and from which bacilli are usually discharged, and those which are sequelæ of nerve changes. The former type, occurring in leprotic tissues, should be called "leprotic ulcers." The latter, which usually occur in nonleprotic tissues and do not discharge bacilli, should be called "trophic ulcers." Traumatic ulcers are particularly liable to occur in tissues affected by trophic changes.

Infiltration.—"Infiltration" is a term commonly applied to a diffuse thickening of leprotic nature involving the skin or mucosa which is not of definite nodular, papular, or macular form. The term may also be applied to diffuse leprotic conditions in other organs.

Nodule.—A nodule is a definitely thickened, rounded, circumscribed mass of leprotic nature commonly occurring in the skin, subcutaneous tissue, or mucosa.

Papule.—A papule is a small solid elevation of the skin, of leprotic nature, not more than 5 millimimeters in diameter.

Macule.—A macule is a circumscribed area of skin showing changes in color, sometimes with slight elevation or depression. The following descriptive terms may be applied to indicate its peculiar characteristics: Hypopigmented, hyperpigmented, erythematous, circinate, marginate, zonal, raised, atrophic.

3. THE MICROÖRGANISM

Nomenclature.—There is considerable variance in practice in the formal designation of the organism of leprosy. Common practice countenances the informal use of the term "bacillus" for rod-shaped organisms in general. The generic name *Mycobacterium* is now

extensively used for the acid-fast group to which the organism of leprosy belongs. Therefore, while it is permissible to speak colloquially of "the leprosy bacillus," it is recommended that it be not referred to formally as *Bacillus leprae* (*B. leprae*), but as *Mycobacterium leprae* (*M. leprae*).

"Toxins."—Attention may be drawn to the fact that "toxins" of *M. leprae,* in the sense used in bacteriology, are hypothetical. It is a striking fact that a patient with extensive and progressive cutaneous lesions containing incalculable numbers of microörganisms may show no clinical indication of any kind of toxic effect. In the condition known as "lepra reaction" toxic manifestations are seen, but there is reason to believe that these are not due to true bacterial toxins. In the present state of our knowledge it is advisable to avoid the use of this term.

4. CLINICAL CLASSIFICATION OF CASES

The classification of cases of leprosy is an important but difficult matter. Even with the same viewpoint no two workers in leprosy may necessarily classify any large group of patients precisely alike, because of differences of interpretation and of skill and care in examination. Thus, the confusion arising from the present differences of viewpoint and practice makes it imperative that a serious attempt be made to arrive at some uniformity in this matter.

Primary classification; types.—Leprosy is a general disease; in no type are the lesions confined to a single tissue, and the demonstration of bacilli is not always possible by routine methods. All diagnosable cases are in a sense "mixed," and in consequence any classification should be based primarily on the predominating clinical findings.

This Conference is in agreement that cases of leprosy should be divided into two major types, and that these be designated "neural" and "cutaneous." The division is based on the following considerations.

From clinical and pathological evidence it seems clear that the leprosy bacillus has a very special affinity for peripheral nerves. Clinically there are many cases that, for practical purposes, may be considered essentially neural. They frequently have visible (usually hypopigmented) lesions of the skin, but in typical cases the bacteriological findings by the usual methods are consistently negative. However, it is the experience of some observers that in occasional

typical cases bacilli may be found in the nasal mucosa, though in their clinical course neural cases differ markedly from those with "leprotic" skin lesions (see page 333). Therefore, regardless of the manner in which the bacillus has entered the body, the mechanism of the production of the skin disturbance, or the possible presence of the bacilli in other tissues such as the lymph nodes, it may be agreed that it is reasonable and useful to recognize a nerve, or "neural," type of leprosy. It is to be realized that neural cases may become "cutaneous" through the subsequent development of leprotic lesions of the superficial tissues.

On the other hand, pure leprosy of the skin does not exist as a type. It may be that in exceptional cases lesions of the skin, in which *M. leprae* is demonstrable, may exist before lesions develop elsewhere; but there is reason to believe that in such cases the bacillus almost invariably becomes disseminated and causes lesions in other organs, especially the nerves. Furthermore, in many cases that ordinarily would be classed as "cutaneous" leprosy, a history of primary nerve disturbance can be obtained, and very often careful examination may reveal some degree of sensory disturbance and of nerve thickening. Therefore, on this evidence, such cases are strictly "mixed." Sooner or later, in the natural course of the disease, gross evidence of neural involvement (atrophies, mutilations, paralyses) may be expected to develop. Notwithstanding these facts, in order to minimize confusion, it is deemed desirable to class all cases with leprotic lesions of the skin as "cutaneous."

Cases that have once been cutaneous, but with important neural manifestations (that is, the old "mixed"), and have improved until only the neural lesions or sequelæ remain, require separate recognition. If first seen in this condition they would ordinarily be classed as advanced neural, but they should be considered "secondary neural" in contradistinction to the "primary neural" cases, which have never apparently been of the cutaneous type.

PROPOSED CLASSIFICATION OF TYPES OF LEPROSY

A. MAIN TYPES

Neural (*N*).—All cases that show evidence of actual or previous nerve involvement; i. e., alterations of sensation with or without changes in pigmentation and circulation, trophic disturbances or paralyses and their consequent results; atrophies, contractures, ulcerations. These are not accompanied by leprotic changes in the skin.

Cutaneous (*C*).—All cases showing leprotic lesions in the skin. Such cases may or may not show, at any given time, clinical manifestations of nerve involvement.

B. SUBTYPES (INDICATING DEGREE OF SEVERITY)

Neural-1 (N-1).—Slight neural: Cases with one or a few small areas of disturbed sensation, which may or may not show alterations of circulation or pigmentation, paralyses or trophic disturbances of minor degree.

Neural-2 (N-2).—Moderately advanced neural: Cases with extensive or numerous areas of disturbed sensation, not confined to any part of the body; with paralyses or/and visible evidences of trophic disturbances: marked depigmentation, moderate atrophy, keratosis, bullæ, etc.

Neural-3 (N-3).—Advanced neural: Cases with more or less ex-extensive areas of anæsthesia and marked motor and trophic disturbances; marked paralyses, atrophies, contractures, trophic ulcers, and mutilations.

Cutaneous-1 (C-1).—Slight cutaneous: Cases with one to a few leprotic macules, or a few small areas of infiltration, or nodules.

Cutaneous-2 (C-2).—Moderately advanced cutaneous: Cases with numerous leprotic macules, or fairly numerous or marked areas of infiltration, or nodules, frequently with lesions of the mucosa.

Cutaneous-3 (C-3).—Advanced cutaneous: Numerous or very marked leprotic lesions in various stages of development or retrogression, usually with lesions in the mucosa.

In all cutaneous types there may be varying degrees of neural involvement and such cases should be recorded to indicate the degree of this involvement; as, for example, C-2, N-1.

Secondary neural.—Neural cases that were formerly cutaneous, but from which the active leprotic lesions have disappeared.

5. ADMINISTRATIVE CLASSIFICATION OF CASES

In order to facilitate the application of preventive measures to leprosy, it is desirable to reduce probable sources of infection. To accomplish this it is necessary to recognize that leprosy is probably perpetuated through the implantation of the organism in favorable environment, such as new susceptible hosts. This implantation is believed to be effected through the dissemination of *M. leprae* from the mucous membrane, skin, and perhaps from the excretions of the infected host. We have no absolute criteria of infectivity, but ex-

perience has shown that in cases in which the organism can be found in the skin or mucous membranes it may also be found at times on the surfaces of these. Such conditions would thus favor its dissemination. Cases from which dissemination seems probable should therefore be classed as "open;" while other cases may be considered "closed." Administrative action concerning the two classes might well differ in its application according to the community affected.

Closed cases were formerly described as "bacteriologically negative;" but since this implied that no bacilli could be obtained from the accessible lesions by the ordinary methods of examination and since the expression might be misinterpreted to mean that there were no bacilli in the tissues, it is recommended that it be replaced by the term "closed" in administrative practice.

6. LEPRA REACTION

Lepra reaction is one of the most interesting and important phases of the disease. It is of frequent occurrence and may vary from a painful neuritis or the reddening of an isolated skin lesion to a general exanthematous eruption or a sudden marked increase in the severity of existing lesions with ulcerations and toxic manifestations, and if protracted may lead to death. Such reactions are frequently referred to as "acute exacerbations" of the disease. This may be misleading. At times lepra reaction may, indeed, initiate an actual advancement of the disease and on subsidence of the acute reaction the original lesions may be larger or more numerous than before. On the other hand lepra reaction may prove beneficial, for after its subsidence the lesions may improve.

This phenomenon and its therapeutic control should be subjected to further study. The whole subject of the value of artificially induced reactions in therapeusis also needs further investigation (see Appendix III).

7. EARLY DIAGNOSIS OF LEPROSY

Special stress is to be laid on the importance of the diagnosis of early and slight cases of leprosy, and of their treatment, both from the point of view of prevention of the disease and of relief of the patient. The sooner a patient is put under treatment the more promising are the results and the less the danger that such a patient will infect others, if the prevailing view that the disease is transmitted from man to man be correct. This view the Conference upholds.

All persons responsible for the diagnosis of leprosy should, therefore, acquaint themselves with the signs and symptoms diagnostic of leprosy in its earliest stages (see Classification of Cases, N-1 and C-1).

8. METHODS OF EXAMINATION

Accuracy of diagnosis and the evaluation of improvement depend upon the methods of clinical and bacteriological examination employed and upon the care and skill with which they are applied.

Clinical.—The use of crude methods as well as careless practice may result in failure to detect cases of slight degree and may also lead to gross errors in estimating the progress of the case. The importance of adopting proper methods of clinical examination cannot be overemphasized (see Appendix I).

Bacteriological.—The significance of the bacteriological findings cannot be considered other than more or less arbitrary. In routine practice the examination is confined to limited portions of the superficial tissues, skin, and nasal mucosa, and even repeated negative findings do not prove that *M. leprae* is absent therefrom. It can usually be assumed that in neural cases the organisms are present in the nerves at least and that in cutaneous cases they are present also in the deeper organs (see Appendix I).

9. TREATMENT OF LEPROSY

The treatment of leprosy that seems most likely to succeed includes both general and special measures. These measures should be adjusted to the nature of the individual case, and not applied indiscriminately.

General measures.—The general measures that appear to be most applicable do not differ materially from those used in other infectious diseases whose course is often of great chronicity. However, it is believed by physicians experienced in this disease that careful and persistent efforts to eliminate intercurrent affections which tend to reduce the general resistance of the patient are essential to successful therapy. Observations suggest that the adjustment of both the quality and the quantity of the diet may be an important therapeutic measure. It is also the belief of those with experience that other general measures, including personal hygiene, supervised or graduated physical exercise, occupational therapy, the stimulation of morale, and mental welfare are also of definite value.

Special measures.—Special measures include those that may stimulate the general healing processes, and those that attempt to effect

the resolution of individual lesions. Such measures include the administration of drugs and the application of physical agents.

The drugs most widely used are oils or their derivatives. The oils in very common use are those of *Hydnocarpus wightiana* and *H. anthelmintica* (chaulmoogra group). The derivatives of these oils that are receiving most attention among clinicians treating leprosy are the ethyl esters of the respective fatty acids and the soaps (sodium salts) of these acids. Available clinical evidence indicates that the therapeutic value of these oils is similar, and this is true also of their derivatives. The choice of these for use in treating leprosy may therefore rest on other factors; such as, the ease with which they may be procured, their cost on delivery, their purity and freshness, and their keeping qualities.

The ethyl esters have been intensively used in large treatment centers and are preferred by the workers in those centers, as well as by others. The preference for this derivative seems to be influenced by the fact that a process of its manufacture has been attained that permits of the repeated production of a stable, uniform, and standardized product; also by the fact that when administered by injection, it produces less local irritation than that caused by some other derivatives The degree of irritation produced by the injection of the esters may be reduced by the addition of metallic iodine (0.5 per cent) to them (see Appendix IV). However, other workers have preferred to use either the oils, or the sodium salts of their fatty acids. These drugs, also, can be administered by injection, intramuscularly or subcutaneously. They have not been used sufficiently by intradermal injection to admit of comparison with the esters.

The methods of injection may be intramuscular, subcutaneous, intracutaneous, or intravenous. Selection will be influenced to some degree by the nature of the medicament used; for example, it is difficult to inject the oil intradermally, and the esters or a solution of the soap is preferable when this method is used. Attention is called to the fact that oils and esters should not be given intravenously. Recent evidence tends to show that lesions of the skin resolve more rapidly when treated by intradermal injections. The dosage of these various preparations cannot be arbitrarily established, but must be adjusted to the condition of the individual.

Other oils have been used in a manner similar to that adopted with the hydnocarpus group, but experience of their use has not been sufficient to permit of an appraisal of their value.

To stimulate reparative processes in a patient measures have been adopted for the production of a controllable febrile reaction, not of a specific nature. These measures have included the use of preparations such as foreign proteids, either of bacterial or of other origin, or exposure to physical agents. The physical agents employed for this and for special purposes in the treatment of leprosy include ultra-violet light, radiant heat, hot baths, carbon dioxide snow, fulguration, and diathermy.

Other drugs, especially preparations of gold and other heavy metals, have been advocated for use in special cases, but such drugs should be employed with caution. Iodides have been employed, but they are contraindicated in many cases. Experience has shown that their use should be limited to patients whose general condition is such that they can tolerate full doses of hydnocarpus preparations and maintain at the same time good general health. Adequate control by those skilled in the treatment of the disease is essential.

Standardization and appraisal of treatment.—It is impracticable at this time to establish a standard method of treatment. However, a method that has proved satisfactory is the intradermal injection of preparations of the hydnocarpus (chaulmoogra) group of oils, preferably combined with intramuscular injections (see Appendix II).

It must be recognized that the course of leprosy is often of great chronicity, and final conclusions concerning the therapeutic value of a drug or method cannot be reached until after its use for one to several years. Further, it must be appreciated that there is no accurate method of measuring such therapeutic value. Both clinical estimates and microscopic examinations are subject to many errors. Skill, care, and adequate staff are necessary to carry out these examinations accurately.

Organization of treatment.—This will vary with the number and type of cases to be treated, and with the available personnel and facilities. It will also depend upon the political, geographical, and economic conditions of the community, as well as upon the attitude of the patients and of the general public towards the whole subject. For purposes of treatment, cases may be grouped into classes in accordance with their probable response to treatment and their prognosis regarding arrest or recovery. Under favorable conditions, such classes may be cared for in separate sections of an institution or, preferably, in separate institutions. While certain types and classes of patients may be adequately treated as out-patients, it will be

apparent that cases requiring close supervision and those who are incapacitated should have institutional care. Under the latter conditions clinical observations can be made more accurately and the patients' regimen can be controlled.

10. EVALUATION OF PROGRESS

In the evaluation of progress it is necessary to use terms to define the stage to which the patient has progressed. Such terms are indicated below. Cases may be classified with regard to the course of the disease as active, quiescent, and arrested.

Active cases.—"Active" cases are those in which there are clinical or microscopic evidences of progressive or of recessive changes in lesions, with or without accompanying systematic disturbances.

These evidences include the following: Positive bacteriological findings in skin or mucous membrane determined by the usual methods; the presence of raised or erythematous lesions; increase or diminution of lesions in size or number; tenderness of nerves, with or without thickening.

Quiescent cases.—"Quiescent" cases are those in which there is no longer clinical or microscopic evidence of activity as defined above.

For the purpose of attaining uniformity of method, the classification "quiescent" should be applied to cases from which the signs of activity have been absent for a period of at least three months. This absence of activity should be determined by at least one examination a month during this period. This examination should include a clinical examination, and also microscopic examinations of the nasal mucosa at more than one site, and of lesions of the skin at more than two sites.

Arrested cases.—"Arrested" cases are those that have remained quiescent for a period of at least two years.

Cure, relative cure; negative.—Use of the term "cure" in relation to the results of the treatment of leprosy is open to misunderstanding; and it is, therefore, recommended that this term should not be employed in the terminology of leprosy. Since the term "negative" is often misinterpreted and the term "quiescent" is more descriptive of progress than "negative," it is recommended that the term "negative" as applied to patients likewise be discontinued. It is further recommended that the term "relatively cured" be not used, since it includes the word "cure;" and that the condition to which it is applied be described by the term "arrested."

11. FOLLOW-UP OF PATIENTS

This Conference considers it desirable to lay emphasis on the need of following up, over a considerable period of years, patients who have apparently recovered under treatment, in order to ascertain the ultimate results thereof. This is important from the scientific and public-health viewpoints, as well as from that of the welfare of the patients. The findings of certain workers who have made a survey of released cases open to question the permanency of the results obtained in recent years. Further knowledge of this matter is greatly needed.

12. STUDY OF CONTACTS

The opinion expressed at the last international conference on leprosy was to the effect that leprosy is a communicable, rather than a congenitally acquired, disease. No satisfactory evidence has been adduced that would invalidate this opinion. Therefore, it is desirable to emphasize the importance of studying the contacts of known and especially of "open" cases. Such work may be difficult and expensive, but the studies should throw important light on the epidemiology of the disease and on its earliest manifestations. It may be that the eradication of leprosy from any given area will depend upon the application of knowledge so gained.

13. STANDARDIZATION OF RECORDS

The Conference strongly indorses the conclusion of the Leprosy Commission of the League of Nations concerning the desirability of attempting to standardize the forms used in recording and reporting leprosy work. It feels that this is of great importance in the comparison of results obtained by different observers, which is almost impossible at the present time.

As the work will entail the collection and detailed study of forms now in use in various active institutions throughout the world and can best be done under the auspices of a permanent organization, the Conference resolves to invite the Leprosy Committee of the League of Nations to undertake this and, after preparing standardized forms, to circulate these to leprologists throughout the world.

III. PROPHYLAXIS

The Conference has not specifically dealt with the subject of prophylaxis in leprosy.

The findings of the Bangkok meeting (1930) of the Leprosy Commission of the League of Nations, which have not yet been released for publication, were placed before it.

The Conference gives its approval to these findings in principle.

IV. RESEARCH

While there are many facts regarding leprosy that may not be known even after intensive and prolonged research, there are others that require prompt investigation because of their immediate importance in more effective control of the disease. A recent survey made by the Leprosy Commission of the League of Nations has also shown that there is lack of coördination in the research now in progress. The following program of subjects, which seem to be in urgent need of investigation, is therefore submitted.

1. EPIDEMIOLOGY

It is believed that studies in the epidemiology of leprosy are greatly needed. There are serious defects in our knowledge of the incidence with regard to race, geography, environment, occupation, climate, family history, age, sex, and diet; also the incubation, duration, apparent spontaneous disappearance, incidence among healthy attendants in leprosaria, spread in newly invaded areas, apparent immunity in certain districts or areas as compared with others, etc.

Comparison of observations made over widely scattered areas is highly desirable. In order that the data collected in such observations may be of the greatest value, they should be as complete as possible, systematic, and made by units of trained personnel. An outline that includes most of the details considered essential to accomplish this is appended (see Appendix V).

However, much can probably be learned from surveys that cannot be made in so intensive a manner, and it is suggested that these should include as many of the outlined data as may be feasible.

Any survey might well include inquiries into native folklore, traditions, and superstitions regarding the disease.

2. CLINICAL STUDIES AND THERAPEUTIC EXPERIMENTATION

The clinical course of the disease has been studied, for the most part, in cases that are now classified as of moderate or marked advancement. It is of great importance that studies be made for the purpose of detecting the disease in its earliest stages. The clinical observations in such cases should be supplemented by the development of technical procedures which may be applied to the patient

or executed in the laboratory. Investigations should be made of individuals who may not have shown clinical evidence of the disease and of those who have apparently recovered. Such investigations might be regarded as those of latent leprosy, and may include various cutaneous tests or cuti-reactions with specific vaccines, and the determination of the persistence of *M. leprae* in the nasal mucosa.

The clinical phenomenon known as "lepra reaction" is worthy of particular attention, because of its frequent occurrence in the course, and because of its apparent alteration of the course of the disease. Its causes, nature, and control are still undetermined.

Investigations of clinical phenomena should be intimately correlated with the effect of therapeutic measures on the patient. This is especially pertinent, because of the failure to produce in animals conditions that closely resemble human leprosy. The interpretation of pharmacological investigations in animals should be considered with regard to their probable effect in man. Some remedies may produce marked disturbances in the course of the disease, and their use may be dangerous in certain stages, while in others they may be beneficial. The use of iodides, especially potassium iodide, should be studied in this connection. Their employment, however, should be attended with extreme caution; and it has been suggested that the indication for their administration may be determined and controlled by the application of the red-blood-cell sedimentation tests. Various remedies for certain phases of the disease should be explored, such are exemplified by the use of tetradotoxin and dilo oil (*Callophyllum bingator*) in lepra reaction. There is also further need for carefully controlled tests and more accurate appraisal of the special remedies now commonly used, and for those of physical therapy; such as, electrotherapy, mechanotherapy, hydrotherapy, actinotherapy, and physiological exercise.

3. DIET

Differences have been noted in the incidence of leprosy in the people of various regions in India, Korea, China, and other countries, which suggest that intensive studies of the diet of the people are desirable. These studies should include the foods in use, the methods of preparation, the degree of preservation (freshness, decomposition), the quantity (famines), and the quality (vitamins, inorganic salts). The effect of diet in general therapy is also of importance.

4. ETIOLOGY AND PATHOGENESIS

The entire subject of the pathogenesis of leprosy is in need of investigation, and this should comprise studies of *M. leprae,* including the possibility of its growth in cultures of tissue; its chemical and biological relationship to other bacteria of the acid-fast staining group; and its behavior in animals when inoculated from suspensions made from lesions, but freed of tissue. Efforts should be continued towards finding an animal susceptible to inoculation (anthropoid apes); the preferable site of inoculation; the effect of massive doses of the inoculum; and repeated inoculations. Animal diseases that resemble leprosy (rat leprosy) may also afford a fruitful field.

Research is urgently needed concerning the site and manner in which the organism invades the body; its dissemination through the tissues and its seeming selectivity for certain tissues and sites in them; and the pathological changes produced by it in the first or early clinical lesions, in leprides, in the nerves throughout their course, and in the bones and blood vessels as well as in the skin. The pathology of the tissues of the patient who has been treated should be investigated.

These studies should also include those of immunity, and should embrace serological and cytological studies (lepra cells), allergy, and the relation of vaccines of *M. Leprae* and other acid-fast organisms. (Tubercle bacillus B.C.G.)

5. BIOCHEMISTRY

Experience with leprosy suggests that the metabolism of the case of leprosy is deranged, and it is also thought that the type of the food consumed by the patient may alter his susceptibility to the disease. It is evident, therefore, that biochemical studies are needed in this regard in metabolism, vitamins, inorganic salts, proteids, carbohydrates, and fats. Knowledge of chemistry of the blood (lipoidal content) may also be of great value in interpreting various phases of the course of the disease.

6. PHARMACOLOGY

The pharmacological action of remedies (for example, metals) applied to this disease may be different from that in others; and it is, therefore, necessary to investigate the special action of drugs that have been used and to develop others, which may be of greater value. Such studies may well be made of the action of the drugs

now in use on *M. leprae,* the action of the various preparations of the hydnocarpus group (and of other oils), native remedies, synthetic remedies, new remedies, the selective action of drugs, and the relation of the secretions of the endocrine glands.

APPENDICES

I. DETAILS OF EXAMINATION

(*a*) *Clinical examination.*—The whole body should be examined, in so far as is possible, in a good light and all the findings accurately recorded. While many auxiliary tests may be employed, the following methods are important:

1. Sensation to light touch.—The patient should be blindfolded. The normal skin should be repeatedly touched with some light object, such as a cotton swab, a feather, a camel's-hair brush, or a spill of paper, and the patient asked to indicate accurately with the point of the finger the place touched. When the patient is responding to these stimuli, the suspected skin areas should then be similarly tested, loss of sensation to light touch being indicated by repeated failure to respond. In this way anæsthetic areas may be gradually mapped out.

2. Sensation to pain.—The eyes being blindfolded, a suspected skin area is alternately touched with the head of a pin and pricked with the point, a corresponding normal area being similarly examined immediately afterwards. The patient is questioned as to which prick produces more pain, the touch with the head or the prick with the point. This process should be repeated several times so as to avoid error.

3. Sensation to heat and cold.—This may conveniently be tested under similar conditions by touching suspected areas with two test tubes alternately, the one containing hot (40 to 50° C.) and the other cold water (20° C. or lower), the patient being asked to distinguish between them.

4. Thickening of the skin.—The detection of slight degrees of skin thickening often requires considerable care. Inspection, with or without a magnifying glass, should be supplemented by palpation, the suspected area being rolled between the finger and thumb. Comparison should be made with the surrounding skin and with the corresponding area on the other side of the body.

5. Thickening and/or tenderness of the nerves.—The superficial nerve trunks in normal individuals are frequently palpable and firm pressure may elicit slight pain. The determination of thickening and abnormal tenderness should depend on careful comparison with the nerve, if unaffected, on the other side of the body or with the corresponding nerve in a healthy person of similar build. The superficial nerve trunks most commonly affected are the ulnar, the superficial peroneal, and the great auricular. Sensory branches supplying macules are sometimes tender and palpably thickened.

6. Mucous membranes.—In examining the nasal mucosa it is advisable to use a speculum, and the field should be well illuminated.

(*b*) *Bacteriological examination.*—Particular stress is to be laid on the need of examining smears from several sites and of making repeated examinations. Organisms may be demonstrable in one lesion or in only one part of it, while in another lesion they cannot be detected. In the early progressing

cutaneous case the organisms in a lesion may be few and scattered, later becoming more numerous and generalized, while the converse may be true in the case as it improves.

Smears should contain as little diluting material (blood, lymph) as possible, but the specimen should be so taken as to contain cellular material from the deeper layer in which the organisms are normally to be found.

1. Skin examination.—There are two principal methods of procuring material for examination; namely, the "scraping" and the "snip." By the former a very small cut, about 2 millimeters deep, is made with the scalpel well into the dermis, and material is scraped from the depth of this and smeared on a slide. By the latter method a small portion of the dermis, at least 2 millimeters thick, is snipped off with a sharp pair of scissors, curved on the flat. The raw surface of the tissue so obtained is applied to a slide and firm pressure is exerted so as to express as much as possible of the cellular elements.

2. Nasal examination.—With the use of a nasal speculum the interior of both nares is carefully examined for infiltrations, nodules, and ulcers. If any of these is found, material should be removed therefrom with a blunt narrow-bladed scalpel, or a similar instrument, by scraping deep enough to cause slight bleeding. Even when there is no visible lesion, a scraping should be taken from the septum. *Mycobacterium leprae* may be found on the septum, the inferior and middle turbinates, or the floor of the nose. The material so obtained should be smeared on a slide.

3. Staining.—After drying, and fixing over a flame, smears are stained for at least ten minutes at room temperature or heated three minutes till steam rises, in a solution of carbol fuchsin. This is prepared by mixing one part of a 10 per cent solution of basic fuchsin in 90 per cent alcohol with nine parts of a 5 per cent solution of carbolic acid crystals in distilled water. This solution should be prepared at frequent intervals and be discarded when there is any trace of precipitate.

The slide is decolorized with sulphuric acid (10 per cent) or nitric acid (10 to 20 per cent) in water, and counterstained with methylene blue.

II. METHOD OF TREATMENT BY INTRADERMAL INJECTION

A scheme of treatment in use at some of the largest centers is as follows:

The ethyl esters of hydnocarpus oil, which are prepared in accordance with the methods outlined on page 350, are preferred, but a stable uniform preparation of the sodium soaps of the fatty acids of the oils of this group may be used.

The injections may be given at weekly intervals. Not more than 5 cubic centimeters are given to a patient at any one time, and not more than 0.1 cubic centimeter is injected at any one point in a lesion. Whenever feasible, the lesion to be injected is completely infiltrated by producing coalescing "injection wheals." If the lesions are so small or so few that 5 cubic centimeters cannot be injected into them, the balance is given intramuscularly. The combination of the intramuscular and intradermal administration in each patient seems desirable. The frequency of injections of any one lesion is limited by the local inflammatory reaction.

III. TREATMENT OF LEPRA REACTION

The following methods have been used in controlling lepra reaction.

(*a*) The patient should be put at rest, and if there is no contraindication, a sharp purgative is given, means being taken thereafter to keep the bowels well regulated.

(*b*) A light but well-balanced, nutritious diet should be given.

(*c*) Accompanying diseases should be searched for and treated. The presence of such diseases, though often obscure, may stimulate a lepra reaction.

(*d*) Potassium antimony tartrate given every second day intravenously in doses of 0.02 to 0.04 gram has been found useful.

(*e*) Calcium chloride (20 cubic centimeters of a 5 per cent solution) may be given intravenously.

(*f*) Calcium lactate, 1 to 2 grams daily in divided doses, and sufficient sodium bicarbonate may be given to make and maintain an alkaline reaction in the urine.

(*g*) Lepra reaction may be accompanied by a very painful neuritis, which may lead to rapid atrophic changes in the parts supplied by the affected nerves. Rapid relief of pain may be afforded by the intramuscular injection of adrenaline (0.3 cubic centimeter of a 1,000 solution) diluted in saline, or by the administration orally of 0.05 gram of ephedrine sulphate. The effect of the latter drug is more lasting than that of the former. Instantaneous relief has also been obtained by the injection around a subcutaneous nerve trunk of 10 cubic centimeters of 0.05 gram of ephedrine sulphate dissolved in saline.

In giving special antileprosy treatment care should be taken not to exceed the tolerance of the patient, otherwise lepra reaction may result. Such special treatment should always be discontinued during lepra reaction and until the patient has completely recovered therefrom.

IV. MANUFACTURE OF MIXED ETHYL ESTERS OF HYDNOCARPUS-GROUP OILS

Preparation of esters by hot process.—Ten liters of hydnocarpus oil are boiled vigorously for forty-eight hours with 5 liters of 96 per cent ethyl alcohol and 100 cubic centimeters of concentrated sulphuric acid under a reflux condenser. The principal advantage of vigorous boiling is undoubtedly that it keeps the two layers well mixed. The esters are then separated from the lower layer, from which the excess alcohol can be recovered by distillation. The esters are washed three times with about 20 liters of water, separated from the washing water, and dried in a steam kettle or on a water bath. The yield from 10 liters of oil is about 11 liters of esters. Proportionally smaller amounts of materials may be used to prepare smaller lots of esters.

Distillation.—The washed and dried ethyl esters are then distilled at 20 to 25 millimeters pressure in a glass or iron still.

Washing with alkali.—Before neutralizing the esters, the acidity is determined by titration. Five hundred grams of lye (94 per cent sodium hydrate) are dissolved in 80 liters of hot water (90° C.) in a 160-liter steel drum. Forty-five liters of the distilled ethyl esters (2.5 to 3 per cent acidity) are added and thoroughly mixed. If the acidity is higher than 3 per cent a correspondingly increased amount of lye is added. After the mixture has stood for twenty-four

hours the clear lower layer is drawn off through an outlet in the bottom of the tank. Hot water (90° C.) is added to the 140-liter mark, thoroughly mixed, allowed to settle for twenty-four hours, and again drawn off. The washing with water is repeated four times, and each time twenty-four hours are allowed for settling. The yield is about 96 per cent, and the acidity (as oleic acid) is usually under 0.1 per cent. If smaller lots of esters are to be neutralized it may be found necessary to add crystals of sodium chloride to assist the separation. Heating on a boiling-water bath will also hasten the process.

Steaming and drying.—Volatile impurities, which are often irritating, may be eliminated by blowing out with steam. About 15 liters of the washed esters are put in a 26-liter stoneware carboy and steam is passed through the liquid for two hours or longer, until the pungent odor has disappeared from the condensed steam. The esters are placed in ordinary 5-gallon oil tins to settle, poured off from the separated water, and filtered through paper. The product is a clear, very pale yellow, mobile liquid with a slight, characteristic odor. Smaller quantities of esters may be refined by this method.

Ethyl esters manufactured by the above process are of constant composition and relatively nonirritating, regardless of the source or quality of the original oil.

Preparation of esters by cold process.—Four hundred twenty-five grams of cold-drawn hydnocarpus oil of good quality, 550 cubic centimeters of 96 per cent ethyl alcohol, and 32 cubic centimeters of sulphuric acid (sp. gr. 1.845) are placed in a bottle with a tight-fitting glass stopper and left until the process of esterification is complete. The bottle should be shaken once or twice a day to mix the upper and lower layers. This, or placing the bottle in the sun or in some warm place, hastens the process. Neither shaking nor heat is, however, essential if time is not a consideration. At first the oil forms a lower and the alcohol and acid an upper layer. As esterification proceeds a point is reached at which the lower layer, now chiefly composed of esters, is of lower specific gravity than, and rises above, the original upper layer, which now contains a large proportion of glycerol. To ensure the completion of esterification it is well to allow the process to continue for a further period equal to the time required for the rising of the lower layer. Thus, if the lower layer takes fourteen days to rise, the ingredients should be left in the bottle for another fourteen days. When the upper layer dissolves completely in alcohol the esterification is complete; esters, but not oil, being completely soluble in alcohol. The lower layer is then drawn off and the upper layer repeatedly washed with an equal volume of water until the water is free from acid as tested by litmus paper. A 0.1 per cent solution of sodium hydrate in water is then added; this forms a thick emulsion. The vessel is slowly rotated and crystals of common salt are gradually added in small quantities in order to break the emulsion. The lower layer is removed; and the upper layer consisting of esters, after being washed once more with distilled water, is filtered through thick filter paper. The esters, though now clear, still contain a certain amount of fine emulsion which makes them dark in color. This may be removed by drying on a water bath for two or three hours while stirring constantly with a glass rod. The esters are then filtered again and the process is complete.

The esters may be washed in the bottle in which they have been prepared by substituting for the glass stopper a perforated cork with two glass tubes;

one, 2 inches in length, is inserted flush with the inner end of the cork and fitted with a piece of rubber tubing compressed with a spring clamp; the other reaches to the bottom of the bottle. By inverting the bottle the esters rise to the top and the lower layer may be drained off by opening the clamp; or the lower layer may be syphoned off through the long glass tube without inverting the bottle. A separating funnel is more convenient for separating and washing the esters.

Preparation of ethyl esters by hot process without distillation.—The esters may be much more rapidly prepared by placing the ingredients mentioned under the cold process in a flask on a water bath arranged to maintain a constant level of water. A reflux condenser is connected with the flask. The water bath is kept at a temperature sufficient to maintain brisk boiling inside the flask. This is continued without stopping for eighteen hours, when it will be found that esterification is complete. Washing of the esters is then carried out as described in the cold process. The weight of the esters recovered is almost equal to that of the oil used.

In order to produce nonirritating ethyl esters by the last two processes, the original oil must be nonirritating.

Addition of iodine.—Addition of metallic iodine (0.5 per cent) to the ethyl esters markedly reduces the irritating quality of the ethyl esters. Fifteen liters of the purified esters are heated in a 20-liter enameled kettle to 140° C. The esters must be thoroughly dried before iodine is added since, if water is present, it effects by catalysis the hydrolysis of several per cent of the esters. If the filtered esters are clear, the heating to 140° C. before adding the iodine will drive off all dissolved water. Seventy-five grams of chemically pure resublimed iodine are added with stirring. The temperature immediately rises to 150° C., at which point it is maintained for exactly thirty minutes, the liquid being stirred occasionally. After cooling, the iodized esters are filtered into bottles (250 cubic centimeters capacity) and sterilized for one hour in an oven at 150° C. The temperature of the contents of the bottles reaches in this time 110° C. The bottles are tightly corked, and sealed with paraffin or sealing wax and allowed to stand two weeks before use.

Note 1.—Smaller lots of esters can be iodized by this method provided that a shallow (pan) type of container is used.

Note 2.—It is not advisable to use esters after the lapse of two years, although samples that have stood longer than three years do not seem to have deteriorated sufficiently to become markedly irritating.

Note 3.—Iodized esters must be kept tightly corked and preferably in a dark, cool place. Repeated resterilization should be avoided. Heat or sunlight in the presence of air produces a change in the iodized esters, which increases their irritating qualities to a marked extent.

Refining of hydnocarpus-group oils.—Crude hydnocarpus oils are sometimes found to give pain upon injection. A bland, nonirritating oil may be produced by the following method of refining.

Volatile impurities can be removed by passing steam through the oil for about an hour, either before or after washing with alkali. Sufficient steam is used to give an aqueous distillate of about one-fifth the volume of the oil.

The amount of volatile impurities is very small, but the distillate has a strong odor.

The free fatty acids are removed by washing with a solution of caustic alkali, and the only difficulty is the separation of the pure oil from the resulting emulsion. The following method has proven satisfactory. One hundred fifty liters of hot water (about 90° C.) are run into a 400-liter steel drum provided with a faucet at the bottom; 0.5 kilogram of lye (94 per cent sodium hydrate) is added, followed by 100 liters of hydnocarpus oil (not over 2.5 per cent acidity), and thoroughly mixed. With oil of higher acidity a correspondingly increased amount of lye must be used.

After the emulsion has stood twenty-four hours the clear lower layer (about 125 liters) is drawn off. Hot water is run in, while stirring, up to the 350-liter mark.

After two days the slightly opalescent lower layer (200 liters) is drawn off. The washing with water is repeated four times, and twenty-four hours are allowed for separation on each occasion.

Ninety-five liters of oil are obtained, with an acidity of not over 0.2 per cent. This oil is steamed as described above and filtered, while hot, through folded filter papers. The filtrate is dried by heating in an enamel-ware kettle, filtered again, and sterilized in bottles at 150° C.

Some provision must be made for keeping the oil hot during the separation of the emulsion if smaller quantities are refined, otherwise the mixture cools too rapidly to allow separation to take place.

V. EPIDEMIOLOGICAL SURVEYS

The data that should be included in an epidemiological survey are given below in tabular form.

OUTLINE OF DATA TO BE OBTAINED

1. Community. Name and type (village, town, district, country, etc.).
   - A. Geography. Location; topography; geology (soils, etc.).
   - B. Climatology. Temperature (maximum, minimum, mean); humidity (relative, absolute); rainfall (minimum, maximum, mean, seasonal); winds (velocity, prevailing, hurricanes, typhoons, etc.).
   - C. Population. Total number and variation in numbers; censuses or estimates; migrations; number of families.
     1. Racial. Numbers of each; types of each (aborigines, natives, recent immigrants); mixtures (numbers and types).
     2. Social. Religions, castes, etc.; numbers of each, types of each; marriage laws, food laws, etc.; housing: types and sanitary surroundings.
   - D. Occupation. Industrial; agriculture (crops, amounts and types); tenant system (serfdom, overcrowding, communal system, family or larger units); husbandry; fisheries.
   - E. Diseases (general, not leprosy). Prevailing types, incidence of these and frequency of epidemics; endemicity; diseases probably due to faulty diets, type of diseases and prevalence.

F. Leprosy. Incidence; distribution (geographically and by house within the community; note any unusual prevalence along lines of communication or in other districts).

G. School survey. Children; number of children from 1 to 4 years of age (inclusive); number of children of school age; number attending school; number of cases of leprosy in these groups.

2. Family.

A. Blood relations. Name of head of family; number in the family; age of members, sex of members; race; number, age and sex of breadwinners; age of individuals and total for family.

B. Household family. Same data as for A.

C. Diseases. History of diseases other than leprosy in the family, including those prevailing in previous generation. Prevalence of disease in the habitation. Sanitary surroundings of houses.

3. Individual leprosy case.

Name; age; sex; occupation (indicate the type of the labor performed); age; economic status; marital state; race; caste; class; religion; education.

Dietary; foods and proportions of these used; manner of preparation (freshness of food).

Diseases other than leprosy; history, prevalence, etc.; estimate of state of general health.

Leprosy; examine for the following; type (neural or cutaneous and degree of these); probable infectivity; source of infection; history of case; history of previous cases in the family, in relatives and previous generations; contacts, including previous cases in the family or household, as well as casual contacts.

THE INTERNATIONAL LEPROSY ASSOCIATION

It was realized that this Conference afforded an exceptional opportunity to consider the question of a permanent international organization of those engaged in activities concerning leprosy and of others interested in such work. It has long been felt that such a body would serve a useful purpose in stimulating greater interest in the problem and in efforts to obtain more effective results.

Accordingly, information was laid before the Conference concerning two movements to this end. These were (1) a discussion begun in 1922-23 among certain leprologists, which resulted in a decision to organize a society as soon as there should seem to be a possibility of obtaining funds to support a periodical; and (2) a separate movement started in 1925-26 to form an organization to be called "Société Internationale de Leprologie." The latter has unfortunately not become active. The Conference was also advised that the Leonard Wood Memorial for the Eradication of Leprosy would consider sympathetically a request for a subsidy to aid such a plan as the Conference might indorse.

After a thorough discussion of the matter it was unanimously decided that the existing circumstances made it advisable to inaugurate a movement in which due consideration should be given the plans of those previously interested in the matter and every effort made to secure their coöperation. A proposed constitution and by-laws, comprising features of the earlier plans, were studied by the

Conference. Upon reaching agreement on these, the members of the Conference joined unanimously in forming the Association. A meeting of the Association was then held; the constitution and by-laws, subject to modification when organization of the Association has been completed, were adopted, and temporary officers were elected.

The name of the organization is THE INTERNATIONAL LEPROSY ASSOCIATION (Association Internationale de la Lèpre).

The purposes are: "To encourage and facilitate mutual acquaintance and collaboration between persons of all nationalities concerned in leprosy work and the coördination of their efforts; to facilitate the dissemination of knowledge of leprosy and its control; and in any other practicable manner to aid in the antileprosy campaign throughout the world; and to this end to publish a scientific journal of leprosy. It shall endeavor to coöperate with any other institution or organization dealing with leprosy work."

For purposes of expediency provision is made for a Western Section and an Eastern Section; a General Council to be in charge of the general affairs of the association, and Section Councils to be in charge of sectional affairs.

Membership may be of two classes. "Regular membership" is open to all persons with recognized medical or other scientific qualifications, who are actively engaged in connection with the study, treatment, or control of leprosy, or who have been so engaged. "Associate membership" is open to all other persons connected with or especially interested in leprosy.

The chief activities anticipated are those of the holding of meetings and the publishing of a scientific periodical on leprosy. When found desirable and practicable, it is intended that general leprosy congresses shall be convened. It is believed that the sections can hold meetings more frequently, possibly in connection with other medical gatherings.

The proposed periodical, to be called THE INTERNATIONAL JOURNAL OF LEPROSY, will contain, besides suitable original articles, reprintings of important papers that have appeared elsewhere, abstracts, news items, and possibly correspondence and other appropriate material. The editorial control of the Journal will be carried out by a board consisting of an Editor and two Associate Editors, to be chosen by the General Council.

It was agreed that, for some time, it would probably be impossible to finance a satisfactory journal solely from membership fees and subscriptions. Since there was reason to believe that the Leonard Wood Memorial would consider sympathetically a request for a subsidy for this purpose, a resolution was passed requesting such aid for a period of five years. If this is granted, it is intended that publication will commence early in 1932.

The temporary general council elected is: President, Dr. Victor G. Heiser; Vice President, Western Section, Prof. Carlos Chagas; Vice President, Eastern Section, Dr. E. Muir; Secretary, Dr. R. G. Cochrane; Treasurer, Dr. Wm. H. Brown; General Councillors, Prof. Nagayo, Sir Leonard Rogers, Dr. Etienne Burnet, and Prof. de Langen. The council made the following appointments: Editor (and general councillor *ex officio*), Dr. H. W. Wade; Associate Editors, Dr. H. P. Lie and Dr. James L. Maxwell. Elections and appointments of persons not at the meeting are subject to their acceptance.

The temporary council was charged with the duty of enrolling additional members. Upon the attainment of an adequate membership, it will conduct an election of the regular officers, through the post; and shall organize the Sections. It is believed that this can be accomplished within a year. Applications for copies of the constitution and by-laws or other information should be addressed to the Secretary, International Leprosy Association, 29 Dorset Square, London, NW. 1, England.

RESOLUTIONS *

I. Requesting from the Leonard Wood Memorial for the Eradication of Leprosy aid to the International Leprosy Association for the publication of a Journal of Leprosy.

II. Bringing the suggestion to the notice of The Leonard Wood Memorial for favorable consideration the publication and distribution of a booklet containing plans, photographs, and suitable text of the leprosarium and skin dispensary at Cebu, Philippine Islands.

III. Indorsing the note on prophylaxis prepared by the Leprosy Commission of the League of Nations at its meeting at Bangkok in December, 1930.

IV. Conveying appreciation of members of Conference to the Board of Directors of the Leonard Wood Memorial for the Eradication of Leprosy, etc.

The Conference also passed a resolution expressing its grief at the early death of Dr. Eloy V. Pineda, of the leprosy staff of the Philippine Health Service; and a further resolution of appreciation to Mr. Perry Burgess for organizing the Conference and the part he played in its functioning.

[NOTE.—Copies of the original reprints of this report are available on request of the Leonard Wood Memorial, Metropolitan Tower, New York City, or from the International Leprosy Association, 29 Dorset Square, London, N.W.1.]

* The titles of the resolutions adopted by the Conference are here given; their texts are not reproduced.—EDITOR.