

INTERNATIONAL JOURNAL OF LEPROSY

PUBLISHED AS THE OFFICIAL ORGAN OF THE
INTERNATIONAL LEPROSY ASSOCIATION
WITH THE AID OF THE LEONARD WOOD MEMORIAL

Postal Address: P. O. Box 606, Manila, Philippine Islands
Office at the School of Hygiene and Public Health
Entered at the Post Office at Manila, P. I., as second-class matter

Vol. 7

JULY-SEPTEMBER

No. 3

EDITORIALS

Editorials are written by members of the Editorial Board, and opinions expressed are those of the writers. Any statement that does not meet with agreement will be of service if it but stimulates discussion, for which provision is made elsewhere.

THE MYCOBACTERIAL DISEASES

The thought has been entertained in the past that it might be a good thing to exchange workers between leprosy and tuberculosis institutions, the idea being that persons intimately familiar with one of these diseases might in some ways bring a fresh viewpoint to bear upon the other. Whether or not any signal benefit might derive from such an arrangement, it still seems worth while for workers in leprosy to give considerable thought to the phenomena of other diseases caused by acid-fast microorganisms.

Attention given this matter heretofore has consisted chiefly in frequently-drawn comparisons and contrasts of leprosy with tuberculosis, and in the relatively intensive study of the infection called—unfortunately, some writers hold—“rat leprosy.” The recently-discovered “buffalo leprosy,” which resembles the human disease more closely, is too rare and strictly localized geographically to count heavily in this connection.

The idea of a broader understanding of the range of infections, natural and experimental, that come within this class was behind a symposium that was held in June, 1937, by the section on medical sciences of the American Association for the Advancement of Science. The nineteen papers there read have

been published in a volume entitled *Tuberculosis and Leprosy*,¹ they being the principal diseases dealt with. The broader subtitle, "The Mycobacterial Diseases," would have been quite as appropriate since certain other diseases of that class are discussed—not, it may be noted, including rat leprosy. We believe it worth while to call particular attention to this publication and to some of the features brought out therein.

The introduction by White and the summarization by Long indicate the purpose of the symposium and the principal generalizations that can be drawn from it. It was intended to bring into prominence "a common disease process" (called "mycobacteriosis" by Long) caused by the acid-fast family of microorganisms. The outstanding features of that condition are (a) that, whatever the germ involved, it for a time thrives inside of the "monocytes"—cells which many workers would prefer to call "macophages"—and (b) that upon these cells depends the localization of the process, as in the lungs in tuberculosis and in the skin and nerves in leprosy.

Those who wonder if the familiar bacillary form of the leprosy germ is the only one that exists but who have not followed closely recent literature on the subject will find interest in the article by Kahn and Monidez, and also the more general one by Corper, wherein is given something of what is now thought of the matter of morphological variations of the tubercle bacillus and other strains. It is at least evident that present-day investigators are not satisfied that such organisms have only one phase, though the idea of a filter-passing form is no longer in good standing. Since the dissociated forms of a culture of an acid-fast bacillus, they themselves acid-fast, differ as regards their chemical and immunological characteristics and in their pathogenicity, it is evident what complications may be introduced by forms more distant from the common one, if they exist.

That question and, in some instances, the basic one of identification of strains dealt with, complicate the problems of those who work on the chemistry of this group, among whom Anderson and Seibert, who contribute to the symposium, have long been prominent. Among other conclusions that have been arrived at through studies of the effects of different chemical

¹Tuberculosis and Leprosy; The Mycobacterial Diseases. Symposium Series Vol. I, American Association for the Advancement of Science. The Science Press Printing Co., Lancaster, Pa., 1938, 133 pp. (Price \$2.50).

fractions in animals, one is that the bacillary lipids act as stimulants for the mononuclear phagocytes. This is undoubtedly true, and the reaction of the tissues to a foreign substance or organism which gives rise to the "tuberculoid" change has long since been called the "lipoid reaction." However, it would seem not to be the whole story in the production of lesions. We must consider the massive granulomata that sometimes occur in major tuberculoid leprosy even when no bacilli, or very few of them, can be demonstrated by the best methods at our command.

Whatever other applications there may be of the results of chemical work with these microorganisms, the purification of tubercle bacillus proteins has been a long step in advance in connection with the tuberculin test. Hopes that application of similar methods of extraction to organisms derived from leprosy might lead, in that disease, to a useful skin test of the tuberculin class have not yet been fulfilled. That is shown by the results of work done in Manila in 1937,² and in related work, not yet reported, that has been done there more recently with extracts made in Long's laboratory of heavily bacillated leprous spleens. It seems pertinent to ask if the leprosy bacillus actually possesses an antigenic element capable of producing sensitization of the tuberculin type, for of course the lepromin reaction is a very different matter. In this general connection Crawford's discussion of the question of the specificity of the tuberculin reaction in animals will be of interest.

The discussion by Lurie, Sabin, Corper and especially Long of the relationships of host and microorganism with regard to the effects of injection will hold attention. In his summary Long points out the wide variety of natural and experimental disease processes that can be produced by different strains of microorganisms with their variations as regards pathogenicity, in different animals with their varying degrees of natural susceptibility and the added variable of specific immunization. Of the examples that could be drawn from these articles, one is the result of intravenous inoculation of rabbits with the avian tubercle bacilli, which produces for a time a condition—the Yersin type of infection—that is reminiscent of lepromatous leprosy.

² [COMMITTEE, BUREAU OF HEALTH] Summary report on antigenic skin tests in leprosy. *Month. Bull. Bureau of Health (Manila)* 17 (1937) 265-275. Also MCKINLEY, E. B. The present status of diagnostic skin tests in leprosy. *THE JOURNAL* 6 (1938) 33-46.

That condition, however, is not maintained, for if the animal survives the diffuse condition is replaced by one characterized by discrete tubercles; to carry the analogy to leprosy again that condition would suggest, however distantly, the neural tuberculoid form. Since more or less similar differences of infections can be produced with mammalian tubercle bacilli under proper conditions, Lurie asks if it may not be that these two phases—the diffuse (nontoxic, nonsensitized) and the nodular (toxic, allergic)—are developed in all of the mycobacterial diseases, in different degrees and at different rates.

Attention is drawn by Crawford and by Daines to a curious disease of cattle in which, though the tuberculin reaction is usually positive, there are found at autopsy only skin lesions of tuberculoid histology. The difficulty of growing acid-fast organisms from these lesions, and the fact that those which have been grown and are looked upon as specific are chromogenic, brings to mind the situation in leprosy.

Most interesting for its parallels with lepromatous leprosy is Johne's disease, or paratuberculosis of cattle. Here there is a prolonged "incubation period" of one to five or more years, usually a slow and afebrile course, and lesions—as curiously confined to the intestinal tract as are those of lepromatous leprosy concentrated in the skin and related tissues—which consist of a diffuse infiltration of histiocytes and epithelioid cells, without the focalization of tuberculosis and "without the slightest microscopic evidence of degenerative changes" of the cells though in acute cases they contain bacilli in enormous numbers, less numerous in chronic ones. The organism was refractory to cultivation until Twort devised an unusual culture medium. Most interesting in relation to leprosy is the fact that the infection does not give rise to cutaneous allergy, so that skin tests are negative; though as in leprosy subcutaneous or intravenous injections of the antigen give rise to febrile reactions.

These are some of the features of this symposium that appeal to the student of leprosy. The "review" of it published in the current literature section of this issue (together with the separate abstracts of the six articles on leprosy) will give a fuller but still inadequate idea of the matters dealt with. Nowhere can the student of leprosy find a more useful treatment of the broad subject of the mycobacterial diseases than in the original publication, and those who may have felt balked from

acquiring a general idea of this field because of the dispersion of the very extensive literature of the subject will find it an excellent point of departure.

—H. W. W.
