

IMMUNOLOGICAL STUDIES ON LEPROSY BACILLI*

By

HOWARD J. HENDERSON**

Henry Phipps Institute, University of Pennsylvania, Philadelphia

Attempts have been made from time to time to prepare from bacteria believed to be the causative agent of leprosy a product that could be used as an antigen in the precipitin or complement fixation test with the serum of leprosy patients, or a product analogous to tuberculin which might be used in the diagnosis of leprosy infection by a skin test. In general, the preparations have been derived from two sources, *viz.*, acid-fast bacilli isolated in pure culture from the nodules of leprosy patients or leprosy nodules themselves.

The literature on this subject has been reviewed by Wade (1), whose monograph summarizes the papers, most of which are now chiefly of historical interest.

Among the most recent attempts to secure an antigenic substance for the skin test was that of Henderson, Aronson, and Long (2), who prepared purified proteins from two strains of acid-fast bacilli isolated from skin nodules, using the method employed by Seibert (3) in the preparation of a product from tubercle bacilli designated TPT. Intradermal tests with this material, carried out on 158 leprosy patients and 263 non-leprosy persons, were essentially negative.

A much more elaborate study, involving more than five thousand intradermal tests, was made in a cooperative survey arranged by McKinley (4), in the Philippines, in which use was made of protein products prepared by Henderson from four strains of supposed *M. leprae*, one a strain supposed *M. leprae murium*, several strains of tubercle bacilli of human, bovine, and avian types, and several strains of saprophytic acid-fast bacilli. The conclusion reached was that in none of the substances used was there a specific antigen for a diagnostic skin test for leprosy.

It is evident that results comparable to those obtained with tuberculin in persons infected with tubercle bacilli have not been obtained with any preparation used for the diagnosis of leprosy infection. There is certainly more than reasonable doubt as to the justification for using any of the present cultures of so-called leprosy bacilli for this purpose. It would seem logical, however, to use the acid-fast bacilli that are present in leprosy lesions if they could be obtained free from tissue materials, or even if a preparation mixed with such material could be obtained that contained a high concentra-

* Aided by a grant from the American Leprosy Foundation (Leonard Wood Memorial).

** Fellow of the American Leprosy Foundation (Leonard Wood Memorial).

SUMMARY

Injection of acid-fast bacilli, obtained from spleens of human leprosy patients, into normal rabbits did not lead to the development of an anti-serum reacting with the serum of leprosy patients in such a way as to indicate the presence of specific leprosy bacillus antigen in leprosy serum.

REFERENCES

- (1) WADE, H. W. Summary report on antigenic skin tests in leprosy. *Monthly Bulletin Bureau of Health (Manila)*. **17** (1937) 265-275.
- (2) HENDERSON, H. J., ARONSON, J. D. and LONG, E. R. Studies in the bacteriology and immunity of leprosy. (Abstract) *J. Bact.* **31** (1936) 41-42.
- (3) SEIBERT, F. B. and MUNDAY, B. The chemical composition of the active principle of tuberculin. A precipitated purified tuberculin protein suitable for the preparation of a standard tuberculin. *Am. Rev. Tuberc.* **25** (1932) 724-737.
- (4) MCKINLEY, E. B. The present status of diagnostic skin tests in leprosy. *Internat. J. Leprosy.* **6** (1938) 33-46.
- (5) HENDERSON, H. J. An attempt to obtain specific protein antigens from leprosy spleens. *Internat. J. Leprosy.* **8** (1940) 271-283.
- (6) [COMMITTEE ON LEPROSY SKIN TESTS] Skin reaction tests with tuberculin-type extracts of leprosy spleens. *Internat. J. Leprosy.* **8** (1940) 263.
- (7) HENDERSON, H. J. A method for separating intact leprosy bacilli from leprosy tissue. *Proc. Soc. Exper. Biol. & Med.* **50** (1942) 92-94.