

REPRINTED ARTICLES

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LECTURES ON THE ENDEMIOLGY OF LEPROSY¹

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Endemiology is to be defined as the theory of knowledge of the propagation or maintenance of diseases, not in the individual but in a people or a community. The endemiology of leprosy, an ancient disease which has always drawn the attention of the whole world, is as old as the world. It is stated that this disease can be traced from the beginning of history, which means from fifteen centuries before the beginning of our era.

From its nature, this endemiology shows a number of aspects that change with changes of the prevailing medical views of the different periods, but that gradually become settled. Certain important events and discoveries have had such effects on these opinions that it is possible to divide the history of leprosy into special periods.

HISTORICAL DEVELOPMENT

1. Period up to 1850. Characterized by confusion with other diseases; popular belief in the infectiousness of leprosy.

2. Period from 1850 to 1875. Symptoms established, leprosy better defined; scientific inquiry and argumentation about the etiology: (a) the hereditary theory (Danielssen and Boeck, 1848; Commission of the Royal College of Physicians of London, 1862); (b) theory of spontaneous occurrence (Danielssen and Boeck); (c) infectious theory (Drognat Landré, 1867); (d) etiology uncertain (Virchow).

3. Period from 1875 to 1900. The infectious theory gradually prevailing; Hansen describes the leprosy bacillus (1873); British

¹ From a translation, by Mr. G. P. Datema, of the original article published in the *Geneeskundig Tijdschrift voor Nederlandsch-Indie*, 74 (1934) 332-338.

Guiana Leprosy Commission declares the disease infectious (1875); the articles of Munro in the *Edinburgh Medical Journal* (1877); a staining method devised by Neisser (1879); first international leprosy conference at Berlin (1897); "La lèpre est une maladie infectieuse."

4. Period from 1900 to 1920-1930. The infectious theory generally accepted; study of endemiology superseded by study of treatment; important international cooperation, including foundation of the leprosy commission of the League of Nations; conferences on leprosy; handbooks and periodicals; campaigns in many countries.

5. Period 1920-1930 to the present date. Renewed study of endemiology; study of the disposition to development of manifest leprosy; new aspects of etiology and endemiology: Is Hansen's bacillus an active and virulent stage of the organism?

FIRST PERIOD

As is indicated, the first period covers the entire lapse of time from antiquity to the middle of the last century. Though this long period is very interesting from a historical point of view, and though the subject was of much interest from the popular viewpoint, there was very little of value as regards scientific developments in comparison with what we know nowadays about the subject.

In the first place, this period is characterized by great confusion concerning the forms of the disease and the differentiation of its syndrome (*elephantiasis graecorum*, also sometimes called *lepra arabum*), from other diseases. These include *elephantiasis arabum* (filariasis, etc.), syphilis, framboesia tropica, and a number of other skin diseases including the common trichophytoses.

In the second place, this period is marked by a lack of scientific research concerning the etiology of the disease. There was a prevailing conviction that it was infectious; at least there was fear of the patient.

SECOND PERIOD

This period in the development of the leprosy endemiology extends from 1850 to 1875. It is the first period in which there was any important scientific research on the etiology of the disease, for which the book of Danielssen and Boeck opened the way, besides forming a turning point with regard to the general confusion concerning its forms and the popular views concerning it. This book first appeared in Norwegian, but was given little notice until it was translated into French and published in Paris, in 1848, under the title

“*Traité de la Spedalskhed.*” The authors were good clinicians, and they succeeded in differentiating the leprosy syndrome from other forms of disease. They pointed out that, clinically, leprosy is divided into two forms, the anesthetic and nodular, a division which is still maintained. Further, it appears from their description that they had already observed the bacillus.

On the grounds of their studies these two explorers rejected the popular belief of the etiology of the disease, adopting the view that its origin was for the most part hereditary, though sometimes occurring spontaneously. These conclusions were based chiefly on statistical grounds; they showed that the great majority of patients (about 70 per cent) came from leprosy families, that inheritance showed more in the collateral than in the lineal descent, and that the disease appeared more in the second and fourth generations than in the first and third. Critics held that it had not been ascertained whether the lineal descendants of the lepers were born before or after the disease appeared in their parents, and that few of this class of people gave reliable accounts of the existence of the disease among their ancestors. The strongest support for the theory of heredity, or the idea of spontaneous origin, was the negative results of repeated efforts to transfer the disease experimentally to members of healthy families, including the researchers themselves. A great argument against infection had always been the rarity of conjugal infection, which the supporters of the theory of infectiousness could not explain.

Following the publication of the book of Danielssen and Boeck there was a great controversy among the supporters of the different theories that is not without interest today. The book mentioned is not available to the writer, but a publication by a Dutch worker, Vinkhuyzer, convert of the hereditary theory, entitled “*Leprosy, Especially with Regard to its Origin*” and published at The Hague in 1868, is typical of the period before the bacillus was found and attention distracted through real objective observation. Another document of the same period that may be mentioned is a dissertation by Drognaat Landré, printed at Utrecht in 1867, called “*The Infectiousness of Leprosy Arabum, Proved by its History in Surinam.*” This booklet disputes the heredity theory, principally on the grounds of statistics from a leprosy establishment in Surinam; its infectiousness is urged principally because of cases of infection in that country of Europeans from nonleprosy families. It may be noted that Dutch researchers were well known in this period; Surinam was a fertile field of work,

and the old records contain important literature on statistics and observations collected there. One is entitled "Dissertatio da Lepra" (translated in 1771 and reprinted and revised in 1878), and another is "Elephantiasis in Surinam," by Ter Beek (1835).

Naturally, the leading medical authorities took part in the controversy. Virchow, invited to give his opinion on the matter, went to Norway in 1859, but being a careful scientific man he did not arrive at a positive opinion. Very typical is the essay in his handbook of special pathology and therapy (third part, second section, pages 367-424). This was published in 1873, the year in which Hansen first observed the leprosy bacillus.

This period of arguments and experiments of enthusiastic supporters and opponents of theories of the etiology of leprosy ends about 1875, with the description of the leprosy bacillus by the Norwegian researcher Hansen.

THIRD PERIOD

This opened with Hansen's discovery of the bacillus which is constantly present in the tissues of lepers. The significance of this discovery is only appreciated if we bear in mind that ten years were to pass before Robert Koch's discovery of the tubercle-bacillus, and that at the time there was no good method of staining; Hansen worked with unstained preparations and with preparations colored with osmic acid. Following this discovery the theory of infection more and more replaced the other theories, and therefore this third period can be best characterized by that fact. Within two years after the discovery of the bacillus a British committee declared leprosy to be an infectious disease; this was some twelve years after the same committee accepted the hereditary theory. A number of publications accepting this view followed, especially after Neisser, in 1879, devised a method of staining the bacillus. The infectious theory had its greatest triumph in 1897, when the first international leprosy conference unanimously accepted the view that "La lèpre est une maladie infectieuse."

FOURTH PERIOD

During this period, with the general acceptance of the theory of infection, discussion of the question of etiology quieted down and more attention was given to the therapeutic problem. This followed especially Engel Bey's report of the results obtained with antileprol, at the second international conference held at Bergen, in 1909, under the chairmanship of Hansen.

This period is also notable for the pronounced tendency to co-operation of leprosy researchers on an international basis. This tendency was expressed by the conferences mentioned above, and by others held in Calcutta (1920), Rio de Janeiro (1922), Strassbourg (1925), Bangkok (1930), and Manila (1931). Typical, also, are the activities of organizations such as the Missions to Lepers (British, American, and recently Chinese); the British Empire Leprosy Relief Association in the British colonies, including the India Auxiliary; and The Leonard Wood Memorial, a fund raised in the United States for work chiefly in the Philippines. Here also is to be noted the participation of the Leprosy Commission set up by the League of Nations, which in 1930 held a meeting in Bangkok, under the chairmanship of Professor Nocht, and also the establishment of an International Leprosy Research Center at Rio de Janeiro under the auspices of the League and the Brazilian government.

Also to be mentioned are the special periodicals on leprosy, beginning with *Lepra: Bibliotheca Internationalis*, which appeared after the first leprosy conference and was discontinued in 1915 after the outbreak of the World War. The British Empire Leprosy Relief Association in 1928 started publishing *Leprosy Notes*, later, in 1930, changed to *Leprosy Review*, and the Indian Auxiliary started *Leprosy in India* in 1929. Finally, the International Leprosy Association, organized by the Manila Conference (1931), commenced publishing (1933) *The International Journal of Leprosy*, largely supported by the Leonard Wood Memorial. The great interest in the study of this disease is further shown by the publication of handbooks, as "Leprosy" of Rogers and Muir (1925); the encyclopedic "Die Lepra" of Klingmuller (1931) which appeared as a volume of the new "Handbuch fur Haut- und Geschlechts-Krankheiten," and most recently (1934) a large handbook by Jeanselme.

As has been said, in this period the study of the etiology and endemiology of leprosy gave way largely to serious investigations of the therapeutic problem. For a time there was a mistaken optimism in this matter, and experience as regards the permanence of results obtained has often been disappointing.

In reaction to this, the study of the endemiology of the disease has received more attention of late, bringing to mind the old statement that prevention of disease is more valuable than individual recovery. This change is taking place slowly. The study of the thera-

peusis of leprosy still holds much interest, and justly so. But at the same time there are many who no longer expect much from this, and they have again taken up actively the study of endemiology, especially the question of the organism, the factors that determine its transfer, and the circumstances which dispose to the condition necessary for manifest leprosy to develop.