NORWEGIAN LEPERS IN THE UNITED STATES

THE INVESTIGATIONS OF HOLMBOE, BOECK AND HANSEN

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The present note is a historical one, summarizing the results of investigations made by the Norwegian leprologists, J. A. Holmboe, C. W. Boeck and Armauer Hansen, in the last half of the last century, concerning leprosy among the Norwegian emigrants in the United States of America. First, however, a few remarks should be made concerning the views with regard to the origin of the leprosy which at that time were most prevalent among the Norwegian leprologists.

In the treatise of Danielssen and Boeck (2) heredity was put forward as the principal cause of the propagation of leprosy. These authors did not, however, deny the possibility that it might arise "spontaneously," as it might be termed, on account of an unfavorable milieu such as a severe, noxious climate, or unfavorable conditions of living, or poor and inadequate food, in countries where the disease is most common; but they laid comparatively little or no stress on this manner of origin. On the other hand, other physicians held that the spontaneous origin was the only one, and refused to believe that heredity was of any importance at all.

There was also a third theory which had a few followers. They believed the disease to be due to an infection which was spread by contagion. This theory was not sufficiently taken into account in Norway until Armauer Hansen's time, as even those who believed in the possibility of infection did not consider it to be the actual cause of the disease except in a very few cases. They also thought the general cause was heredity or a spontaneous origination.

To solve the many complicated problems regarding the causes of the disease the thought arose that America, where leprosy was not endemic as in Norway, would be the place to study the matter. In this connection it is well to remember that each of the three Norwegian leprologists who went to America for this purpose had his own theory about its origin: Holmboe was an ardent

believer in the spontaneous origin, Boeck of course advocated heredity, and Hansen upheld strongly the theory of infection. If this is borne in mind when reading their reports, all of which were published in the Norwegian language, it is interesting to see how each of them found support for his own theory from the results of his visit to America. This being the case, it is necessary to examine their findings critically.

The first investigator to go to the United States was Holmboe (5), then the chief physician in the Municipal Hospital in Bergen. Leaving Norway in 1863, he traveled through most of the Norwegian settlements in Illinois, Iowa, Minnesota and Wisconsin and in these places got knowledge of about 28 lepers. One of these had returned to Norway suffering from the disease,[1] and Holmboe examined nine cases personally. As mentioned, he was an ardent believer in the theory of the spontaneous origin. Referring to two persons he had examined but had not found leprous, he held that they had been saved from the disease by emigrating to America, as they belonged to very leprous families in Norway and would very probably have gotten the disease had they remained there and continued to live under the unfavorable conditions existing in their homes. Among those that he examined were six who had been leprous when they arrived in America; two had very probably only prodromal symptoms of the disease at that time.

Holmboe's conclusions were as follows:

> No case of leprosy was found among the Norwegians born in North America. On the other hand, among the Norwegian emigrants quite a number of lepers were found, most of whom were leprous when they arrived. In a few cases the disease had appeared after the persons had come to America; but they had come there as adults and in all probability had so lived, both at home in Norway and after their arrival in America, as to prepare them for the outbreak of the disease. After their arrival in America they had not enjoyed the advantages that life there usually offered these people; if they had, the disease would not have appeared.
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> Leprosy transplanted to America has, as a rule, a slower and milder course and shows a greater tendency to self-healing and improvement than it does in Norway. Life in America, as a rule, will prevent the development of leprosy, so that many people have remained in good health there who certainly would have been victims of the disease if they had stayed in Norway. The climatic conditions have undoubtedly a great influence in the matter, as the American climate is not as severe as that in Norway and, therefore, not so much is exacted of the resisting power of the organism. The altered mode of living and, on the whole, the common well-being of the emigrants—the majority of whom are or may be under far better external conditions than

[1] The writer knows personally of four lepers who came back from America to Norway with this disease.

in Norway—have just as much influence in the matter; people in America as a rule do not need to expose themselves to the climatic influence, and if they do so, they have better weapons and therefore more resisting power against it. Leprosy will disappear among the Norwegians in America and will only be found as some few imported cases, and it will not be able to propagate through generations as an endemic disease."

As one would expect, Boeck, who laid the main stress on heredity and ascribed very little importance to spontaneous origin, could not accept Holmboe's conclusions without further investigation. He also went to America and stayed in the Norwegian settlements there from September, 1869, to July, 1870. In his travels he came across 18 cases of leprosy. In nine of the patients the disease had broken out in the course of $2\frac{1}{2}$ to 14 years after their arrival in the country. Eight of these nine had leprosy in the family, either in direct or in collateral lines.

Boeck believed, contrary to Holmboe, that this fact proved that leprosy must be a hereditary disease, as the persons concerned must have all brought with them the "latent" disease—or the "disposition" to it—from their homes in Norway. He recognized that the Norwegians in America lived under better conditions there than they would have in Norway, but in spite of that he was quite convinced that leprosy might develop in America, even with great intensity, many years after their arrival, in individuals who had gone there with a disposition to it. He also concluded that the disease might get worse among people who brought it with them; in fact, he held that this was usually the case, and that it rarely remained stationary or got better. Any improvement that he had noticed was not greater than was often seen in Norway in patients who had gone into a hospital.

Boeck gave the following results of his investigations:

"I want to say that, if I formerly may have doubted the theory about the heredity of the disease, I have now no longer any doubts about it." With regard to the one patient from Vess (one of the nine mentioned above) in whose family no trace of leprosy was found, Boeck said that should one not succeed in finding leprosy in the family there by further investigation, "then this could bring one to consider a *contagion*, though everything that has come to our knowledge until now has quite dissuaded me from that opinion." As has been noticed, he too was of the opinion that the improved hygienic conditions among the Norwegian settlers were of importance, and he added, "There is no doubt that, in another century or more, conditions will have improved so much that the *spontaneous* occurrence of the disease will diminish and very probably even cease to exist; but leaving that point out of consideration we know that, through heredity, leprosy will still continue to spread through generations."

It was Holmboe's opinion that, to check leprosy, the state

should give help to those districts where it was most prevalent, so that the general hygiene and the mode of living on the whole might be improved. Isolation was of little value, as the question of heredity is practically of very little importance. Boeck, on the other hand, thought that isolation of patients in hospitals was the most important measure, it being the only way to prevent procreation among the people concerned and thus to check the hereditary spreading of the disease. According to his view authority should be granted to apply strong pressure upon the lepers to get them to go into hospitals, since a proposal to forbid by law marriages between lepers had been rejected.

Like Holmboe, Boeck did not find leprosy among the children who were born in America, but he assumed the reason for this to be that the emigration had been so recent that there could not be many children who could be expected should suffer from leprosy. He did not doubt that in time the disease would be found among those children, though perhaps not to the same degree as if the parents had continued to live in Norway. He also believed that in every leprous family that emigrated to America the disease would gradually die out; but for all that he was certain it would remain in those families for a very long time.

This was in 1870. Just at that time Armauer Hansen began his investigations on leprosy, which in 1873 led to the discovery of the bacillus. He, of course, was the first representative and advocate in Norway of the infection theory, and he looked everywhere for support of his view. According to my opinion his report to the Medical Society of Kristiania (Oslo) in 1874 (3) is his principal work on the subject. In that paper he emphasized with keen logic the difference between heredity of physiological characters and transmission of a disease-causing virus from parents to the offspring. It is thus quite wrong to speak about "*hereditary*" syphilis, as that disease is not transmitted by heredity of a physiological character but by infection —infection in utero—and must on that account be looked upon as *congenital*, not hereditary. The same arguments could be applied to leprosy; transmission of a leprous virus is not heredity, but infection.

Hansen could not agree with the conclusions of Holmboe and Boeck regarding their investigations in America. He was, however, of the same opinion that the study of the transmission of the disease must be much easier in a country where it

was comparatively new and only appeared sporadically than in a country where it had been endemic for a considerable period. Consequently in January, 1887, he went to North America to study leprosy among the Norwegian population, going as the guest of his friend, Dr. Edvard Bockmann, in St. Paul, who paid all the expenses of the journey. The results of this investigation were published in 1889 (4).

Two Norwegian physicians, Knud Hoegh in Minneapolis, formerly in La Crosse, and Chr. Groenvold in Goodhue County, Minnesota, were both interested in the subject that Hansen was investigating and they had collected much information about Norwegians suffering from leprosy in America. Chiefly through their help Hansen got data on 153 such cases in Minnesota, Dakota, Wisconsin and Iowa. To this number must be added another eight cases which he examined personally, and also the six cases recorded by Boeck; there must, therefore, have been at least 167 lepers in the United States. Twelve, probably fourteen, of them were still alive at that time. Hansen did not get an opportunity to examine conditions in Iowa, but he believed that very likely there would be still other cases there. Considering them, and others who must have emigrated later, Hansen some years before his death in 1912 estimated the total number of Norwegian lepers in the United States could be reckoned at about 200.

The number of cases in which Boeck found the disease to have broken out after their arrival in America, Hansen believed, must have depended on the fact that the findings were based on the patients' own statements. But such statements are not very reliable, as the first symptoms of the disease are difficult to detect and patients are not very observant as regards themselves. These circumstances diminished the value of these cases as proofs of the heredity of the disease, quite aside from the fact which Hansen had earlier emphasized, namely, that a period of ten to fifteen years between the time of infection and the outbreak of the disease was not impossible.

For a case of leprosy to afford real proof of heredity, it would be required that people born in America of leprous descent had become lepers under conditions that would completely exclude the possibility of infection. But Hansen could not find any lepers at all among Norwegian people born in America. A number of the leprous emigrants had left numerous progeny, but none of them had developed the disease so far as he could find out.

He had examined a number of these persons and found every one of them in good health. The main point for him was that he had not found a single case of leprosy in America that could be referred to as hereditary, as he had not found, among all the emigrants who had leprous relatives, anyone who had become leprous after they had come away from the unfavorable surroundings in which the disease is usually acquired in Norway. Heredity is not modified in such a way merely by emigrating from one country to another.

Hansen agreed that leprosy as an endemic disease did not flourish among the Norwegians in America, but he did not think that the climatic conditions could be the only reason for this, as the disease progressed in those who had it quite as well there as in Norway. His explanation of its failure to continue among the Norwegian emigrants, who were principally peasants, was that they had learned and acquired in America much greater cleanliness as regards their persons and their homes than in Norway, and the houses were larger and more roomy. All of the lepers had their own rooms and beds, "and probably one does not need any more to guard oneself against getting leprosy by infection."

Hansen closed his article by saying that he was certain that, if he had had more time at his disposal, he would have come across still more persons in America who were descendants of lepers or had leprous relatives in Norway but who had not caught the disease and so would have given still more proofs of its nonheredity. "I imagine, however, that the above stated results of my investigations are sufficient proof that leprosy is not a hereditary disease."

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