

The 100th Anniversary of Armauer Hansen's (1841–1912) Death

February 13th 2012 marked the 100th anniversary of the death of Dr. Gerhard Henrik Armauer Hansen. His discovery of *Mycobacterium leprae* (also called Hansen-Bazillus/Morbus Hansen/Hanseatis after him) in the 1870's marked the beginning of the bacteriological study of leprosy and provided an important impetus for research.

After extensive studies dating back to the mid-19th century, Danielssen and Boeck had argued that leprosy was not just a dermatological disease but also affected the internal organs. They made the first observations of what Hansen later identified as *Mycobacterium leprae*, the bacteria causing leprosy. When Hansen published his results in 1874, both the bacteriological knowledge and the technology used for this research was still in its infancy. The work of Danielssen and Boeck enjoyed great authority among their contemporaries, which was attributed also to the reputation of these two scientists.

Hansen's discovery was based on the theory that leprosy is not hereditary, but transferable - at the time an unusual idea. The long incubation period (average 5 years), and therefore irreconstructible pathways, had given the impression that leprosy was a hereditary disease. Hansen was forced to vigorously defend his thesis of the contagiousity of leprosy. Particularly the followers of the heredity theory, including Daniel Danielssen, his mentor manager, and father-in-law, initially criticised him.

In the summer of 1879, finally, he was paid a visit by Albert Neisser. Even though he could not yet confirm the results using the Koch-Henle-Postulate, Neisser was convinced that Hansen was on the right track, and returned home with some preparations. Back in Wroclaw, Neisser took up competition with Hansen. Koch provided both scientists with the same advice, namely to colour the preparations for a longer period (up to 24 hours). Using this method both came almost simultaneously to the same results. Both also published their results almost simultaneously. Neisser, however, published his paper in the first edition of the newly established and therefore virtually unknown "Wroclaw Medical Journal," Hansen, in contrast, in the internationally recognised "Virchows Archiv." Subsequently Hansen received the support of Danielssen and Rudolf Virchow, who wanted to establish Norway as the country of the most famous leprosy researchers, and brought Hansen wide acknowledgement. Nevertheless, his theory of the contagiousity of leprosy was yet to be proven.

In order to confirm his hypothesis, Hansen observed a statistically significant group of leprosy emigrants to the United States, but all their descendants were healthy. Although similar observations had already been made in the colonies of European countries, it was only with Hansen's discovery of the pathogen that the observations became interpretable. Together, the two studies allowed him to make the conclusion that leprosy is caused by bacteria and that it is a contagious disease.

He presented his results at the first International Leprosy Conference in Berlin in 1897. This fostered his reputation as the “discoverer” of *Mycobacterium leprae* and the contagiousness of leprosy.

Mycobacterium leprae was one of the first bacteria ever discovered, and the first micro-organism to be identified as causing human disease. So it is “difficult to appreciate today how much the scientific world view of contemporary medicine was shaken when Gerhard Armauer Hansen proved that leprosy is caused by a bacterial pathogen” (Feldmeier, p. 57 translated by author). Still today, leprosy is not eradicated, mainly due to insufficient social and hygienic conditions in the countries concerned. This is all the more distressing given the fact that their impact of these factors were correctly identified already by Hansen, who also put this discovery into practical use in his asylum.

The fact that leprosy was defeated in Norway and, eventually, Europe owes much to Hansen's work. His contributions were crucial pieces in the big puzzle of leprosy, which is still far from complete.

Further reading:

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Merke HE, Faber WR, Pieters T. Charles Louis Drogat Landré and Gerhard Henrik Armauer Hansen: Contribution from a Dutch Colony to the discovery of the Leprosy Bacterium. *Lep Rev*2010; **81**: 82–86.
Vogelsang TM. *Gerhard Henrik Armauer Hansen 1841–1912. Leprabasillens Oppdager*. Hans Liv og Hans Livsverk, Gyldendal Norsk Forlag, Oslo, 1968.

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07.11.2012

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