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# 150-year anniversary of leprosy bacillus

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## EDITORIAL

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The author has completed the ICMJE form and declares no conflicts of interest.

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**A century and a half after the leprosy bacillus was discovered, far too many people are still contracting the disease. The anniversary is an opportunity to shine a new and necessary spotlight on the disease.**

Late in the evening of 28 February 1873, Gerhard Armauer Hansen (1841–1912) wrote in his notebook that, in a section taken from a lesion in a leprosy patient, he had seen 0.006–0.0015 mm rod-shaped bodies under the microscope (1). Was this the pathogen he had been searching for? Armauer Hansen was convinced, but he was not at all sure that he could convince anyone else.

In 1873, leprosy was still a widespread public health problem in Norway, with over 1700 recorded cases that year. Competing theories about the aetiology of the disease were proposed, and lack of civilisation, diet and miasmas all had their advocates. Even before he sat down at his laboratory microscope at Lungegaard Hospital in Bergen, Armauer Hansen was convinced that the disease was contagious. When the registration of leprosy patients was introduced in 1856, there were just over 2850 cases. When this figure fell, Armauer Hansen believed that the transfer of patients to an institution was reducing the number exposed to infection. His boss, however, was of a different opinion.

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In 1847, his boss, Daniel Cornelius Danielssen (1815–94), together with Carl Wilhelm Boeck (1808–75), claimed that the disease was due to a 'hereditary dyscrasia' (2). The disease ran in families. Danielssen and Boeck warned that the view of leprosy as a contagious disease was not only flawed, but that it had led to inhumane treatment of the sick during the Middle Ages (2). Being contradicted by a young whippersnapper angered Danielssen at first. But the next day he returned to Armauer Hansen and said he still believed he was wrong but wondered what was needed to be convinced.

It took time before Armauer Hansen's colleagues were convinced (3). When the contagion theory was eventually accepted, there was also support for effective but brutal prevention. Leprosy patients were sources of infection. They had to be identified and isolated for the sake of the healthy majority, argued Armauer Hansen. On his initiative, the Storting passed leprosy laws in 1877 and 1885. At the inaugural international leprosy conference in Berlin in 1897, Armauer Hansen called for global infection control advice, with the message: Do as Norway does! Leprosy laws were subsequently introduced worldwide, which in many cases were practised much more stringently than in Norway (4).

Today we know that *Mycobacterium leprae* is likely transmitted by droplets from the nose and mouth of leprosy patients, and perhaps also from those who are asymptomatic (5). In a small proportion of those infected, the bacteria's invasion of macrophages in the skin and Schwann cells in the peripheral nervous system will lead to loss of pigment and sensation in the skin after a few years of incubation. Without treatment, the disease can result in deformities of the hands, feet and face, and cause severe functional impairment. Patients with visible lesions can be faced with other people's fear of infection, and even today risk being shunned by society.

The first treatment was administered in 1941, but its efficacy was soon weakened when the bacteria developed resistance to the drug. It was not until the 1980s that multidrug therapy was introduced. This stopped the contagion, cured patients within six months and would become the most important tool in a global campaign that made great strides in reducing the public health

problem of leprosy. Since 2005, the decline has unfortunately plateaued at around 200 000 new cases each year, mainly among the poor in over one hundred countries, but mostly in India, Indonesia and Brazil (5).

*«Discrimination and exclusion of leprosy patients from society hampers the efforts to find those with the disease and their close contacts»*

Discrimination and exclusion of leprosy patients from society hampers the efforts to find those with the disease and their close contacts. WHO's new strategy to combat leprosy – otherwise known as Hansen's disease – therefore has a major focus on ending the stigma and discrimination attached to the disease and improving the treatment and rehabilitation of patients (5). In 2017, the UN appointed a Special Rapporteur on discrimination against persons with leprosy.

In the decades that followed Armauer Hansen's discovery of the leprosy bacillus in 1873, Robert Koch (1843–1910) and others discovered several disease-causing bacteria. This scientific revolution changed medicine's view of the nature and causes of diseases and laid the foundations for better diagnostics and infection control, and eventually specific treatment and vaccination.

The University of Bergen is marking the anniversary as a reminder of leprosy as a global public health problem, to show solidarity with leprosy sufferers and to learn the lessons of history. The anniversary year started with a conference on stigma and discrimination held in the Vatican (6). The year will continue with a commemoration in Bergen on the anniversary itself, followed by a film festival, exhibitions, a virtual tour of Armauer Hansen's office and laboratory, and an international conference in Grieghallen (7).

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