Freidrich Loeffler and Diphtheria

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Freidrich August Loeffler (1852-1915), a German bacteriologist obtained his MD from the University of Berlin in 1874. He became assistant physician at the Charite Hospital in Berlin, served as military surgeon from 1876 to 1879 and public health officer in Hannover (1879).

He was sent to the newly established Imperial Health Office laboratories in Berlin in 1879. This assignment proved to be a turning point in his career, as nine months later Robert Koch arrived to set up bacteriology laboratory, which soon became leading center for research and discovery. Koch chose Loeffler and Gaffky as his assistants. The next four years were to be highly productive for all the members of Koch’s group.

During Loffler’s four years at the Imperial Health Office laboratories he pursued a number of bacteriological problems. A significant practical result of these studies was the positive identification of the infectious agent of glanders, a disease seen mainly in the horses. Studies were made by the new experimental methods and exacting criteria as applied by his chief Robert Koch which became famous as Koch’s postulates.

Loeffler’s best known work is with the elucidation of characteristics of the diphtheria bacillus and its growth in pure culture. For the first time bacteriologists could work with single microbial species in a sample which might be teeming with myriads of organisms of different species. In 1883 at a German Medical Congress, Edwin Klebs presented new information pointing to a specific bacterium that could be seen and implicated it to the disease. He could not culture it in pure growth. The bacillus was difficult to culture on the usual gelatin plates because it would not grow at low temperatures required to keep gelatin solid; but Loeffler still had to culture Kleb’s bacillus. With his innovative experimental skills he developed a new solid medium using heated blood serum rather than gelatin (Loeffler’s serum). The medium could now be inoculated at 37 degrees. Kleb’s bacilli grew well and when injected in guinea pigs, produced lesions similar to human diphtheria.

Loeffler reasoned and postulated that perhaps the organisms released a poison or a toxin that seeped out of the membrane colony reaching other parts of the body through blood to weaken and destroy the vital organs causing death. He published exhaustive report of his work in 1884. The supposition soon proved correct by the work of Emil Roux and A.Yersin who did much to reveal the nature of diphtheria toxin.

Loeffler also studied and called attention to the fact that not all people infected by diphtheria bacilli had the disease. This concept of a healthy carrier had immense public health significance.

In 1897 he investigated foot and mouth disease in the cattle and made yet another fundamental discovery. It was knowledge of the agents known as filterable viruses which passed through porcelain filter and were still capable of causing disease. In 1913 he was recalled to Berlin to succeed Gaffky as director of the institute. He was active at the beginning of WW-I in planning hygiene for the army. However his health began to fail and he died in 1915, having greatly contributed to the golden age of bacteriology. The Friedrich Loeffler Institute (FLI) is the National Institute for Animal Health of Germany. It was founded by Loeffler (1910) and named after him in 1952.