J Neurol (2008) 255:1439–1440
DOI 10.1007/s00415-008-0917-4

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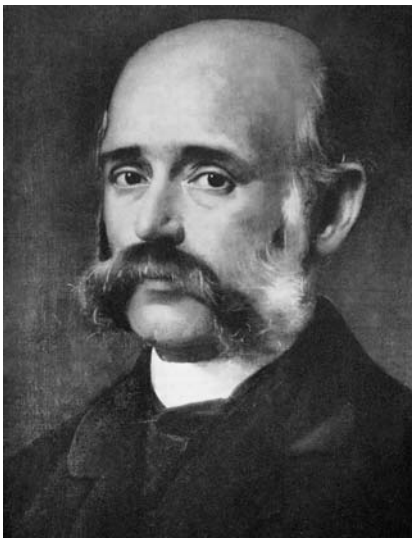

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Received: 14 January 2008
Received in revised form: 31 January 2008
Accepted: 15 February 2008
Published online: 30 May 2008

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Carl Weigert was born on 19th March 1845 in Münsterberg in Silesia, as the son of a hotel owner. From 1862 he studied medicine at the Universities of Breslau and Berlin. Amongst his teachers were Rudolf Heidenhain (1834–1897) and Rudolf Virchow (1821–1902). Between 1868 and 1870 he worked as an assistant to Wilhelm Waldeyer (1836–1921), who since 1867 held the chair of pathological anatomy in Breslau. During the Franco-German war of 1870/71 Weigert functioned as an army physician. However, Weigert disliked clinical practice and rather wanted to do research with the microscope. In 1874 he became an assistant of Julius Cohnheim (1839–1884), one of the founders of German pathology. In 1875 Weigert habilitated in pathological anatomy.

When Cohnheim went to Leipzig in 1878, Weigert accompanied him and was appointed *Extraordinarius* in 1879. After Cohnheim's untimely death in 1884 Weigert hoped to become his successor but his candidature was rejected, perhaps because of his Jewish ancestry. Deeply disappointed, Weigert considered a post as physician at one of the health resorts in the provinces, but the *Senckenbergische Institut* at Frankfurt/Main made an appealing offer. Here he could work as a pathologist and as prosector of the hospitals in Frankfurt. He would remain there from 1885 to his sudden death from coronary sclerosis in 1904 [4, 6].

Weigert was neither a neurologist nor a neuropathologist in the strict sense. He published nearly a hundred papers, covering the whole field of pathology, and was one of the most brilliant researchers in histological techniques and staining. In 1904 Alois Alzheimer (1864–1915) praised him as "the master who created the tools for us" [7].

His most important contributions to neuroscience were the development of two staining methods. The problem child of his last years was his neuroglia stain, which was a source of permanent frustration to him [3]. The second contribution was the myelin sheath stain, developed between 1882 and 1891. To understand this seminal contribution it is necessary to sketch the history of histological techniques. In Weigert's early years things were desolate. Looking back at 1894, he gave a lively description of how agonising it was for a student around 1860 to "get a good section from the stinking, so-called 'fresh', i.e. half rotten, unhardened (pathological) material with his razor" [4]. But at the beginning of the 20th century histological technique was a well-developed science which furnished scientists with a multitude of methods. Particularly the period between 1870 and 1900 might well be called the "golden years of neuroanatomy" [1]. Around

1860 the anatomist Joseph Gerlach (1820–1897) introduced carmine, a deep red pigment of a scale insect, into histology. He stained preparations of the spinal cord which made fine structures more visible than any other technique. Until 1880 the carmine stain dominated the staining of nervous tissue preparations, but it did not show all elements of the central nervous system. Particularly the fine fibres in the cortex remained unseen.

Weigert was eager to develop a stain to make those fibres visible – a precondition for understanding the structure and function of the cortex. He was well acquainted with staining techniques for bacteria and viruses, because he was one of the first to use them. During an epidemic of smallpox in Breslau in 1870/71 he had been able to explore the cutaneous efflorescences in different stages of 200 corpses [4]. These staining methods prompted progress in bacteriology. In the spring of 1876 Robert Koch (1843–1910) visited Weigert, since he was convinced that only technical improvements of microscopy such as staining could improve bacteriology. Subsequently he used Weigert's methyl violet stain for his famous research in wound infections [5]. And when some time later the detection of the tubercle bacillus failed at first, Koch eventually succeeded by using Bismarck brown – a stain Weigert had introduced into histology.

Stains that worked with bacteria, Weigert reasoned, might also work with fibres in the cortex – though at first he failed with the new aniline dyes (which by then were widely used). Finally he came to test acid fuchsine. Some progress could be seen, but the finest fibres remained invisible. Then Weigert used fuchsine, again with improvements, but only fine fibres in the medulla spinalis and in the medulla oblongata could be seen – the cortical fibres were again resistant. But Weigert was not a man to capitulate. He brooded about other solutions until he came to realize that the staining of the myelin sheath required a mordant (a substance that forms an insoluble compound with the dye). Eventually he was successful by using hematoxylin (the product of campeche wood, a tree from Central America) with potassium bichromate as a mordant. Now Weigert saw the finest fibres of the complex "spider web" in the brain more brilliantly and detailed than ever before [8]. Only now it was possible to unravel the secrets of the "wires" of the brain – Weigert's close friend Ludwig Edinger (1855–1918) maintained that this method had been the "starting point of a new period in science" [2]. Indeed it was the basis of the understanding of the complex structure of the brain.

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