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PIONEERS IN NEUROLOGY

Theodor Meynert (1833–1892)

Hassan Yarmohammadi · Golnoush Sadat Mahmoudi Nezhad · Behnam Dalfardi · Ahmad Ghanizadeh

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Theodor Meynert, a leading figure in the history of neurology, was a 19th century neuroanatomist and psychiatrist who made several significant contributions to the field of neuroscience (Fig. 1) [1, 10]. At present day, he is recalled by the eponyms of Meynert's commissure, Meynert's bundle, the solitary cells of Meynert, and the basal nucleus of Meynert. This nucleus is thought to be of significance in Alzheimer's disease as the main cholinergic input to the hippocampus [1, 4].

Originally from Dresden (now located in Germany), Meynert was born on June 14, 1833. Meynert's mother worked as a singer at the opera, and his father was a historian [8, 9]. In 1841, when he was about 8 years old, his family moved to Vienna, Austria, which was then Austria's main center for neurological studies [1, 4, 9, 10]. During his school years, Meynert's favorite subjects were music, philosophy, and literature [9]. Later, he entered medical school in Vienna [3]. In his course of study at the university as a medical student, he became interested in the brain [9].

H. Yarmohammadi · G. S. Mahmoudi Nezhad · B. Dalfardi (✉)
Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
e-mail: Dalfardibeh@gmail.com

H. Yarmohammadi · G. S. Mahmoudi Nezhad · B. Dalfardi
Research Office for the History of Persian Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

A. Ghanizadeh
Research Center for Psychiatry and Behavioral Sciences, Shiraz University of Medical Sciences, Hafez Hospital, Shiraz, Iran

A. Ghanizadeh
Department of Psychiatry, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

During his medical education, Meynert had the opportunity to work as a student of Carl von Rokitansky (the founder of modern pathology) and Carl Wedl (an Austrian pathologist) [8, 9]. Later, Rokitansky accepted Meynert as his assistant. This association had a deep influence on Meynert [1, 8, 9].

In 1861, Meynert earned his MD degree [8]. That same year, he published his first paper, entitled *Lesions of the Pons and Midbrain with Report on Important New Methods of Preparation* [9]. His thesis, entitled *Bau une Leistungen des Gehirns und Rückenmarks mit Beziehung zu deren Erkrankungen* (*Structure and Function of the Brain and Spinal Cord and their Significance in Disease*), provided him the opportunity to become Manager of Prosectorium at the State Psychiatric Hospital in Vienna. It also facilitated his receiving the academic title of Privatdozent in 1865 [8, 9].

In 1870, Meynert became an associate professor, and then, in 1873, he graduated to the degree of professor ordinarius (full professor) of nervous diseases [3, 7]. From 1873 to 1892, he held the position of professor of neurology and psychiatry in Vienna [4]. In 1870, he became Extraordinarius of Psychiatry and the manager of the First Psychiatric Clinic [1, 9]. In 1887, he launched a neurological outpatient clinic [8]. In 1890, Meynert wrote *Klinische vorlesungen uber psychiatrie auf wissen schaflichen grundlagen* (*Clinical Lectures about Psychiatry on Scientific Bases*) to publish his remarkable concepts [8]. Meynert died on May 31, 1892, in Klosterneuburg, Austria [7].

From 1889 to 1892, Meynert worked as the editor of *Jahrbücher Für Psychiatrie* (*Annals of Psychiatry*) [4]. He also worked as the co-publisher of the *Vierteljahrsschrift für Psychiatrie* (*Quarterly Journal of Psychiatry*) and the *Archiv für Psychiatrie und Nervenkrankheiten* (*Archives of*

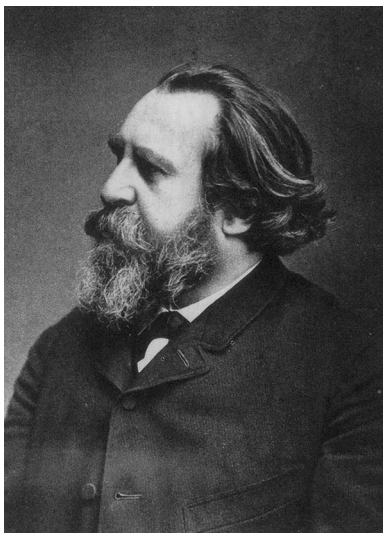

Fig. 1 Theodor Meynert (1833–1892)

Psychiatry and Nervous Diseases) and was chief of the Wiener Verein für Psychiatrie und Forensische Psychologie (Viennese Society for Psychiatry and Forensic Psychology) [8].

Meynert investigated both the anatomical and physiological aspects of the human central nervous system [7]. He illustrated five horizontal layers of nerve cells within the human cortex [1, 4]. The septum pellucidum, both hippocampal and visual cortexes, and the olfactory lobe were the specific foci of Meynert's studies [4, 8]. In 1867, for the first time in the history of medicine, Meynert depicted and illustrated the presence of neurons in the sub-cortical portion of the human brain's white matter in both the superior frontal and primary visual human cortex [5].

Meynert was the first to correlate anatomy to psychiatry. His works can be regarded as early efforts into today's biological psychiatry [7, 10]. He considered psychological diseases to be organic problems originating from the brain [6]. In his book, *Diseases of the Forebrain*, published in 1884, Meynert correlated mind problems to the forebrain [4]. His work made a basis for the theory of cortical localization (e.g. the localization of the aphasia center) and modern cytoarchitectonics [10]. Today, he is often regarded as the founder of brain cytoarchitectonics [1].

Meynert investigated the anatomical structure and histology of the brainstem and the cerebrum as well as the topography and functional associations of the brain's major connecting fiber systems [10]. In the book, *Stricker's Handbook of Human and Animal Histology*, published in 1872, Meynert provided the first detailed description of the brain cortex, its cellular diversity and lamination [3, 8]. He distinguished between the allocortex (cortex with a white surface) and the neocortex (cortex with a grey surface). Meynert theorized that different parts of the brain will act as a whole. He differentiated between the primary receptive areas and the associative areas of the brain. Meynert was also first to develop the idea that motor pathways originate from the brain cortex and move downward [1]. In 1871, he proposed the role of basal ganglia in the pathophysiology of Parkinson's disease. Today, Meynert's commendable drawings of the brain are housed in the Neurological Institute of Vienna [4, 8].

Meynert was the first to look at the field of brain research as an independent interdisciplinary project [9]. Today, he is known as the founder of scientific brain research [10]. Meynert's works deeply influenced generations of neurologists succeeding him. His work had great impact on figures such as Paul Emil Flechsig, Arnold Pick, Karl Wernicke, Auguste-Henri Forel, Bernard Sachs, and Sigmund Freud, most of whom were his students [4, 8].

Conflicts of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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