

The history of neurology in Wisconsin: The early years, 1907-1957

Phiroze Hansotia, MD; Norman C. Reynolds, Jr, MD

The history of neurology in Wisconsin is best appreciated by reviewing the early development of clinical neurology in Europe in the late 19th century, the practice of medicine in Wisconsin in the beginning of the 20th century, and finally the beginning and growth of neurology in Wisconsin in the 20th century. Brief biographies of the pioneers of neuropsychiatry at the University of Wisconsin and the work they did give insight to the final separation of neurology from psychiatry.

The Development of Neurology in Europe

Modern medicine evolved in Europe in the late 18th and early 19th centuries. The techniques of clinical examination developed gradually, with Leopold Auenbrugger introducing percussion in 1761, and Rene Theophile Laennec adding auscultation in 1819.¹ Clinical neurology developed much later, in the latter part of the 19th century. Rapid advances in clinical neurology were preceded by fundamental discoveries in the physiology of the nervous

system by Bell, Magendie, and Hall; in neuroanatomy by Remak, Golgi, and Cajal; and later with descriptions of neuropathology of certain disorders by Virchow, Alzheimer, and Speilmeyer.²

During the second half of the 19th century, three schools of neurology spearheaded the birth of this field. The first was in France, under Jean Martin Charcot at the Salpetriere, the second was led by Wilhelm Heinrich Erb and Herman Oppenheim in Germany, and the third, in England, was influenced by Hughlings Jackson and William Gowers at The National Hospital for Neurological Diseases at Queen Square in London.²

The neurological examination of a patient that we use today was developed between 1870 and 1900, and elaborated on in the early 20th century.³ Prior to 1870, observation of gait, expression, movement disorders, palpation of limbs, and gross testing for presence or absence of sensation completed the neurological examination. In 1875, Jean Charcot included the testing of deep tendon reflexes and added routine ophthalmoscopic examination to the neurological exam. By 1890, the neurological examination was divided into mental, motor, sensory, and reflex examinations. Gowers introduced the testing of coordination in the late 1890s, and Babinski added his famous sign in 1896. Vibration and position sense

and their relationship to the posterior columns of the spinal cord described by Rydel and Seiffer were added in 1903. Complex sensation testing (two point discrimination, tactile and weight discrimination) was added shortly after.³

Descriptions of neurological lesions and disease flowed from Europe to America, and clinical syndromes were described in meticulous detail. Heinrich Quincke developed the needle and the technique of lumbar puncture in 1891. Then Probster introduced electromyography in 1928, and Hans Berger, professor of Psychiatry in Jena, developed electroencephalography in 1929.²

Neurology as a special discipline was recognized when The National Hospital for Epilepsy and Neurological Diseases at Queen Square, London was opened in 1859. American neurology took root under William Alexander Hammond, professor of Anatomy and Physiology at the University of Maryland, and Surgeon General of the Union Army during the American Civil War. Silas Weir Mitchell and William Osler were also contributors to the early growth of American clinical neurology.² In the 19th and early 20th centuries, most physicians in the United States seeking special training in neurology went to London, Paris, Vienna, or Berlin because neurology was not an established specialty

Doctor Hansotia is an emeritus physician with Marshfield Clinic, Department of Neurology, Marshfield, Wis. Doctor Reynolds is Professor of Neurology with the Medical College of Wisconsin, Milwaukee, Wis. Please address correspondence to Phiroze Hansotia, MD, Marshfield Clinic, 1000 N Oak Ave 1R1, Marshfield, WI 54449; phone 715.389.3443; fax 715.389.3808; e-mail: hansotia@tznnet.com.

in the United States and there were no training programs. Psychiatrists shared interest in neurology with general internists. Psychiatrists with an interest in neurology (neuropsychiatrists) were more numerous than internists with expertise in neurology.

Wisconsin Medicine in the Early 20th Century

Medicine was changing rapidly in the United States and in Wisconsin in the late 19th century. Prior to 1870, physicians evaluated patients by taking a history of the patient's illness and following that with an inspection and a very limited physical examination. After 1870, doctors began using thermometers, stethoscopes, ophthalmoscopes, and occasionally laryngoscopes. Blood smears and urine sediment examination under a microscope was routine, and special tests for typhoid and some other fevers were carried out when requested.

In the late 19th century, tuberculosis, smallpox, diphtheria, measles, and meningitis were rampant, along with influenza and pneumonia, which were often fatal. The germ theory of disease spurred the identification and study of agents causing infection. In the 1890s, diphtheria anti-toxins were introduced, followed by antimeningococcal serum.⁴

Bloodletting, blistering, and poultices were being replaced by scientifically studied compounds for relief of symptoms and treatment of illness. Aseptic surgery, anesthesia, and radiology were initiated into standard practice. By 1910, public health measures had largely curbed many infectious illnesses. The Occupational Diseases Act (1911) required physicians to report cases of poisoning from lead, phosphorus, arsenic, and mercury, and the National Harrison Narcotic Act (1914) created control

mechanisms for the prescription and dispersal of narcotic drugs.

Wisconsin's population grew rapidly in the second half of the 19th century, swelling from 300,000 in 1850 to 2 million in 1900; 40% of the growth occurred in new young cities. By the end of the century, Milwaukee had grown to 290,000, largely due to European immigration. Railroads were built, swamps were drained, houses and farms were built with care to avoid the spread of malaria, and incidence of the disease was reduced.⁴

Medical Education in Wisconsin

Medical education in Wisconsin and elsewhere in the United States remained largely informal until the 1890s. Aspiring physicians learned medicine on the job while serving as apprentices to local physicians. Those desiring medical degrees traveled to Chicago, Cincinnati, Baltimore, or elsewhere in the country. A few medical schools had university connections, but many were privately owned and run for profit. Until the latter part of the 19th century, most schools required attendance at lecture courses for three months for their medical degrees. Major reforms in medical education, stemming from the Flexner Report of 1910,⁵ led to a new breed of medical schools that taught medical sciences and clinical medicine. This new medical education led to a dramatic increase in the accuracy of medical diagnosis and improvement in the efficacy of treatment.⁴

The new state of Wisconsin passed a law in 1848 establishing a University of Wisconsin with four departments: law, medicine, theory and practice of elementary instruction, and science, literature, and the arts. Sixty years lapsed before the University of Wisconsin opened a two-year medical school. Abortive

attempts at opening medical schools in Madison in 1854, Milwaukee in 1875, Galesville in 1862, and La Crosse in 1864 finally led to the state supporting the creation of a premedical course in 1887 that saved students a year when they enrolled in the medical school in Chicago.

This program was successful and grew rapidly, leading to the opening of a two-year medical school at the University of Wisconsin in Madison in 1907. Charles Bardeen was its first dean. Abraham Flexner (of the Flexner Report) judged this medical school to be a model of its kind.⁶ Under Bardeen, the University of Wisconsin did very well. It expanded its school to a full four-year, preclinical and clinical program leading to a medical degree (MD) in 1925. Bardeen retired in 1935 and was succeeded by William Shainline Middleton, a distinguished clinician.⁶

The medical school in Milwaukee had a more checkered past. The Wisconsin College of Physicians and Surgeons was initially organized as a joint stock company in 1893, abandoning this effort in 1906. It became a nominal medical department of Carroll College in Waukesha and became a member of the American Association of Medical Colleges. A year later, in 1907, a competing joint stock company, the Milwaukee Medical College and School of Dentistry, opened. The practices of this institution were so questionable that the Council on Medical Education (CME) of the American Medical Association censured them. Despite this, Marquette University adopted this college as its medical department.⁶ Flexner described this school in his final report as "being without a redeeming feature."⁵ Two years later, when the medical college refused to change despite a 'C' rating by the CME, the entire stu-

dent body left en masse. They enrolled in the Wisconsin College of Physicians and Surgeons with the understanding that major improvements would occur to obtain a decent rating from the CME.

Without students, Milwaukee Medical College disappeared, freeing Marquette University. In 1913 the financially distressed Wisconsin College of Physicians and Surgeons was bought by Marquette University and named Marquette University School of Medicine (now Medical College of Wisconsin).⁷ Within two years the school had achieved an 'A' rating from the American Medical Association Council on Medical Education. The school has since gone on to develop a distinguished reputation in many fields of medicine.

The Development of Neurology in Wisconsin: The University of Wisconsin

In 1907, the superintendent of Wisconsin State Hospital in Madison drew up a 10-year plan for development of that institution (now Mendota State Hospital). A section of that plan included a department of research with a staff neuropathologist who would also serve on the faculty of the University of Wisconsin Medical School and teach students. The university had established a two-year medical school in 1907 that provided preclinical education to its students. Space and equipment for research on mental and neurological diseases were to be provided by the university. The Board of Control of Wisconsin State Hospital was unable to obtain a neuropathologist, and much of the suggested development plan was not realized for years. The Board felt, however, that an active laboratory would be of service to all state institutions and preserved this idea by designating the research laboratory as the

Wisconsin Psychiatric Institute. In 1910, Dr William F. Lorenz became clinical director of the Wisconsin State Hospital at Mendota. In 1914, he was appointed the first director of the Wisconsin Psychiatric Institute.⁶

Doctor Lorenz enjoyed laboratory work. He had perfected one of the early quantitative Wassermann tests and later a flocculation reaction for syphilis that proved highly accurate. He emphasized postmortem studies and was keenly interested in a diagnostic center for the mentally ill. He was also interested in studying the problems of patients in Wisconsin institutions. A New York native, Lorenz obtained his medical degree in 1903 from New York University-Bellevue Medical College. He trained in psychiatry at Manhattan State Hospital, New York. Although not a neuropathologist by training, Lorenz seemed well suited to direct the Wisconsin Psychiatric Institute.⁶

While visiting Wisconsin, Lorenz became interested in Wisconsin's mental health program and its state institutions. In 1910, at the age of 28, he accepted the position of clinical director at the Wisconsin State Hospital at Mendota.⁸ Lorenz spent 1914 on leave with the US Public Health Service doing research on pellagra in the southern United States.⁹ He returned to Madison to become the first director of the Wisconsin Psychiatric Institute, as well as associate professor of neuropsychiatry at the University of Wisconsin. In 1920 he was promoted to full professorship at the university. In 1925 the Institute became a part of the University and established its free testing service for the physicians of Wisconsin. Lorenz continued as professor and director of the Wisconsin Psychiatric Institute until his retirement in 1952.⁸

Lorenz's research contributions

to preventive psychiatry and to treatment of mental disease with drugs were considerable. With Dr A.S. Loevenhart, he developed the use of tryparsamine in treating neurosyphilis, and he played a key role in the development of blood sampling to detect syphilis.¹⁰ He studied the use of carbon dioxide gas and dilute sodium cyanide injected intravenously in the treatment of psychosis, and sodium amytal in the treatment of mental disorders.^{11,12} He also made the first report of patients with catatonic schizophrenia having lucid intervals. His work suggested the concept of shock therapy with agents other than electrical devices and led to the development of present day tranquilizers.⁶

In 1919, the staff of the Institute of Psychiatry became a part of a research group in association with pharmacology and other departments. The arsenicals that had given successful indications in laboratory studies were tried successfully on patients with syphilis. In 1924, the Wisconsin General Hospital was built and a four-year medical school started. In 1925, at the recommendation of Dr Lorenz, the legislature approved the transfer of the Institute of Psychiatry from Mendota to Madison and it became an integral part of the neuropsychiatry department of the medical school and the University of Wisconsin.⁶

The professorial staff of the new department of neuropsychiatry and associated Psychiatric Institute of the Wisconsin Medical School included Drs Lorenz, William J. Bleckwenn and Hans H. Reese.

Dr Lorenz was in charge of laboratory studies and worked intensively with Loevenhart and associates. Tryparsamide, which was found effective in rabbit syphilis by Loevenhart and associates, was proved by Lorenz and collabora-

tors to be valuable in the treatment of neurosyphilis.¹⁰ It remained the treatment of choice until it was replaced by penicillin years later.

Doctor Bleckwenn earned his MD from the College of Physicians and Surgeons, Columbia University, in 1920. After residencies in psychiatry at Bellevue Hospital, New York, and the Wisconsin Psychiatric Institute, he was appointed instructor at the Institute in 1922 and became a professor in 1934. Bleckwenn was in charge of clinical trials of various arsenicals and barbiturate medications. Academically, he was noted for his introduction of sodium amytal in the treatment of psychiatric patients and for demonstrating the effectiveness of picROTOXIN as an antidote to barbiturate intoxication.^{6,13}

A very well-trained neurologist, Dr Reese was interested in the autonomic system and the effects that various drugs and illnesses had on it.⁶ After Wagner-Juaregg's introduction of the malarial treatment of syphilis was confirmed, Dr Reese introduced this form of treatment at the Mendota Hospital. A large multicenter study of this treatment was carried out with the Mayo Clinic and several Chicago medical schools.¹⁴

Born in Germany in 1891, Dr Reese obtained his medical degree from the University of Kiel, Germany, in 1917. He arrived in Wisconsin in 1924 and joined the department of neuropsychiatry at the University of Wisconsin Medical School, as well as the Institute of Psychiatry. He soon earned a reputation as an excellent neurologist, a beloved teacher, and an effective research worker. In 1952, when Dr Lorenz retired, Dr Reese became department chair. He suffered a severe myocardial infarction in 1955 and made a slow but effective recovery. When he returned to work he found that the depart-

ment of neuropsychiatry had been split into a department of psychiatry, to be headed by Dr Roessler, and a department of neurology to be headed by him. Having reached age 65, he elected to retire and initiated a search for his successor.⁶

In 1958, Dr Francis M. Forster, Dean of Georgetown University Medical School, was recruited to chair the University of Wisconsin neurology department, and it was during his tenure that neurology residency training began. Doctor Reese continued to attend his office there through his years as emeritus professor, attend conferences, and serve as attending physician with residents who were seeing hospital consultation requests.

On a more personal note, one of those senior residents was Dr Hansotia, who recalls that Dr Reese emphasized a detailed history and physical examination, and often examined the patient himself. He particularly relished patients with problems affecting the neck, back, and limbs. Each day he requested a review of the literature that had been read on the previous day's patients. He asked more questions than he answered, and urged residents to seek the answers themselves. All through the month he wanted to know what interested them and kept pushing to sharpen their focus. Doctor Hansotia notes that he came to have a deep reverence and affection for Dr Reese. A year later, when he had finished his fellowship and was to leave for the National Hospital at Queen Square in London, England, Dr Reese gave him a personal letter of introduction to Sir MacDonald Critchley, which made his passage there as a registrar much smoother. It was no small wonder that patients, colleagues, and friends were all devoted to him. History will recognize him as Wisconsin's first true neurologist. Doctor Reese passed away in 1973.

Doctor Mabel Masten joined the faculty in 1930 and Dr Annette Washburne in 1933. Doctor Masten had an interest in neurological disease, while Dr Washburne was largely devoted to psychiatry. Both left in the early 1950s for personal reasons.

Through these early years, the practice of neurology was confined to academic institutions like the University of Wisconsin. Family practitioners and general internists encountering troubling neurological problems would refer them to the University Neuropsychiatry Department. After the four-year medical school was set up at the University of Wisconsin in 1925, the University faculty began participating in continuing education programs at county medical society meetings. The first such program devoted to neurology was set up at the Grant County Medical Society Annual Meeting in Lancaster, Grant County, in 1930. The program of the meeting gives some insight into the issues of interest at that time (Table 1).¹⁵

The Development of Neurology: Milwaukee Area

After 1840, large waves of European immigrants were drawn to the Milwaukee area by its reputation as a healthy place with unlimited opportunity. The city soon became overcrowded and subject to recurrent epidemics of cholera, typhus, typhoid fever, plague, smallpox, diphtheria, dysentery, and tuberculosis. Efforts at removing garbage and liming ditches were ineffective. 'Almshouses,' 'pesthouses,' and 'infirmaries' housed the ill but provided no treatment.¹⁶ After the Civil War, an Old Soldier's Home (now the Wood Veterans Hospital) was built to care for war veterans.

In 1928, Marquette University School of Medicine Dean Dr Bernard F. McGrath reorganized the school into 10 departments.

Neuropsychiatry was a division of the Department of Medicine, and Dr William F. Wegge was its chair. A year later the neuropsychiatry division was divided into two sections: psychiatry, directed by Dr Delparde W. Roberts, and neurology, directed by Dr William Wegge. In 1934, Dr John Garvey followed Dr Wegge. Neuromuscular research was a strong interest in the departments, and several contributions, including the neuroanatomy of the motor end plate, were made. In 1960, Dr Garvey was replaced as director of the division by Dr Warren Kempinsky. The modern era of neurology had begun.¹⁷

In 1957, there were only nine neurologists in Wisconsin. Most were at the University of Wisconsin in Madison and a few at the Marquette University School of Medicine. They were teachers and academicians who were consultants to other physicians. There were no neurologists in private practice. Neurology was a specialty that concentrated largely on diagnosis and supportive care and had effective therapy for few neurological diseases. All this was to change dramatically over the next 50 years. In 2000, there were over 260 neurologists in Wisconsin, including 94 in the Milwaukee area, with much of the growth taking place in private practice. The story of the modern era is the latest chapter in the saga of neurology in Wisconsin.

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References

- Porter R. *The Greatest Benefit to Mankind: A Medical History of Humanity*. New York and London: W.W. Norton and Company; 1998.

Table 1. Program: Annual Meeting – Grant County Medical Society, Lancaster, Wis

Dr. William Lorenz	Use of sodium amytal as a) a hypnotic b) to control excitement c) use in certain psychosis d) control of convulsive states e) use in general anesthesia
Dr. Hans Reese	Demonstration of lumbar and cisternal punctures and air encephalography
Dr. William Lorenz	Clinical applications of cerebrospinal fluid testing
Dr. Hans Reese	Myelography and localization of spinal cord lesions
Dr. William Bleckwenn	Non-surgical treatment of head injury
Dr. Schmidt	Surgical aspects of brain injury

- McHenry LC Jr. Garrison's *History of Neurology*. Springfield, Ill: Charles C Thomas; 1969.
- Haerer AF. DeJong's *The Neurologic Examination*. Philadelphia, Pa: Lippincott; 1992.
- Numbers RL, Leavitt JW. *Wisconsin Medicine Historical Perspectives*. Madison, Wis: University of Wisconsin Press; 1981:224.
- Flexner A. *Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching*. New York: Carnegie Foundation; 1910: 317-319.
- Clark PF. *The University of Wisconsin Medical School: A Chronicle, 1848-1948*. Madison, Wis: University of Wisconsin Press; 1967.
- Hamilton RN. *The Story of Marquette University: An Object Lesson in the Development of Catholic Higher Education*. Milwaukee, Wis: Marquette University Press; 1953.
- Collected papers of Dr William Lorenz at the Wisconsin Historical Society, Madison, Wis.
- Lorenz WF. Clinical notes on pellagrins receiving an excessive diet. *Public Health Rep*. 1914;29:2357-2363.
- Lorenz WF, Loevenhart AS, Bleckwenn WJ, Hodges FJ. Therapeutic use of tryparsamid in neurosyphilis. *JAMA*. 1923;80:1497-1502.
- Loevenhart AS, Lorenz WF, Waters RM. Cerebral stimulation. *JAMA*. 1929;92:880-883.
- Loevenhart AS, Lorenz WR, Martin HG, Malone JY. Stimulation of the respiration by sodium cyanide and its clinical application. *Arch Intern Med*. 1918;21:109-129.
- Bleckwenn WJ. Sodium amytal in certain nervous and mental conditions. *WMJ*. 1930;29:693-696.
- Reese HH. Nonspecific and malarial therapy in neurosyphilis. *Am J Syphilis*. 1929;13:348-359.
- Archives of the Wisconsin Historical Society. Madison, Wis.
- Austin HR. *The Wisconsin Story: The Building of a Vanguard State*. Milwaukee, Wis: The Milwaukee Journal; 1976.
- Engbring NH. *An Anchor for the Future. A History of the Medical College of Wisconsin, 1893-1990*. Milwaukee, Wis: Medical College of Wisconsin; 1991.

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