

Mitchell, Silas Weir

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Silas Weir Mitchell (1829-1914)

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Neurology in America may be said to have had its origins in the mid-1800s during the Civil War when Silas Weir Mitchell (1829-1914) and William Alexander Hammond (1828-1900) began treating the attendant injuries to the nervous system. These two men are regarded as the fathers of American neurology as they helped establish the speciality in the second half of the nineteenth century (McHenry, 1985). Mitchell's life displayed a passion for science as a pioneer in neurophysiology and clinical neurology, but he was also deeply interested in the arts and literature and authored numerous novels, plays and poems as well as medical writing for lay readers.

Silas Mitchell came from a privileged family in Philadelphia where his father John Kearsley Mitchell was Professor of the Practice of Medicine at Jefferson Medical College (De Jong, 1982). The family were of Scottish descent and he was the seventh physician in three generations. He enrolled in the University of Pennsylvania at the age of 15, but initially had a poor record, preferring billiards and poetry to his studies. He graduated from Jefferson Medical College in 1851 at the age of 21 and immediately left for Europe with his sister, Elizabeth. In Paris he studied with Charles-Philippe Robin (1821-1885) and Claude Bernard (1813-1878) and was encouraged by the latter to pursue a career in medical research. Robin was professor of histology in Paris and a pioneer in micrographical research.

On his return to Philadelphia, Mitchell commenced medical practice with his father and utilized his skills in microscopy, learned from Robin, to pursue laboratory research with papers presented at the Philadelphia Academy of Natural Sciences. Mitchell was a founder of the American Physiological Society and presided over its first meeting in 1887 and was its president in 1889 and 1900. He was a pioneer American neurologist and neurophysiologist in the period before the establishment of university research laboratories in the USA. His investigations spanned a wide range of topics that included cerebellar physiology, skin innervation, pathophysiology of nerve injury, and toxicology of snake venoms (Mitchell, 1874).

With the outbreak of the American Civil War, Mitchell declined a military surgeon appointment and preferred to continue civilian practice initially at the Filbert Street Hospital where he "began to be interested in injuries and wounds of nerves, about which little was then known". His reputation grew and, when Surgeon General William A. Hammond (1828-1900) established the 400-bed Turners Lane Military Hospital for Nervous Diseases in Philadelphia in 1867, Mitchell was placed in charge (McHenry, 1969). Together with his assistants, George Morehouse (1829-1905) and William Keen (1837-1932), a vast number of injured veterans were examined and exacting notes were kept of their clinical findings. With Keen, he travelled to Gettysburg personally to retrieve many wounded soldiers.

Their detailed case studies led to the publication of their work in numerous papers and books which revolutionized the understanding of nerve injuries. The initial publication of *Gunshot Wounds and Other Injuries* was expanded in 1872 in the monograph *Injuries to Nerves and their Consequences*, dedicated to William Hammond, which through many editions became the standard reference to nerve injuries until World War 1 (Mitchell, 1872). As well as describing the anatomical deficits from nerve injuries, Mitchell also coined the term "causalgia" for the dysaesthesia and autonomic features associated with nerve injuries. Causalgia, currently known as Complex Regional Pain Syndrome type II, is now recognized as a form of neuropathic pain which may follow a wide variety of noxious stimuli (Pearl, 1999). At first his contemporaries considered this phenomenon to be the patient's exaggeration of symptoms, although it became recognized as a distinct syndrome. In addition, he produced seminal reports on phantom pain, reflex paralysis, and nerve recovery after section, as well as post-paralytic chorea and erythromelalgia (Mitchell's disease).

After the Civil War, Mitchell resumed private practice in Philadelphia, but his reputation from Turners Lane led to a large number of neurologic referrals. From the early 1870s, he limited his practice to neurology and was appointed to the Philadelphia Hospital and Infirmary for Nervous Diseases. At this time he recorded: "Shortly after the war I began to find that, in consequence of my published papers, I was being consulted more and more about nervous maladies." His research output continued, with publications including lectures on *Diseases of the Nervous System, Especially in Women*, which was dedicated to Hughlings Jackson. His investigations on the physiology of the cerebellum included studies on birds and traumatic injuries, which led him to conclude that the cerebellum functions as an "augmenting organ to the cerebro-spinal system" (Mitchell, 1869). Later studies described the cremasteric reflex, and with James Lewis he described the phenomenon of sensory reinforcement of deep tendon reflexes. He was one of the first to incorporate testing of the tendon reflexes in the physical examination.

Mitchell published a series of books on medical matters for lay readers. The series began with *Wear and Tear*, which addressed the theme of urban pressures on American life resulting in an increase in "nervous diseases". The success of this popular book led to others, including *Nurse and Patient and Camp Cure* and later by *Fat and Blood – and how to make them*, which highlighted his views on neurasthenia and hysteria and emphasized his concept of "rest-cure" (Mitchell, 1884). This programme of prolonged bed rest, high calorific nutrition and massage gained widespread acceptance for many decades, not only in America but also in Europe. It drew favourable attention from Freud and Charcot (<http://www.whonamedit.com>). Despite Mitchell's status, he was never offered a professorship of physiology at Jefferson Medical College or the University of Pennsylvania. He believed that the reasons were political (De Jong, 1982). Mitchell did, however, receive many academic honours in his lifetime and he was the first president of the American Neurological Association.

From the early 1860s, Mitchell produced poetry and fiction, which was initially published under a pseudonym. In 1863 he wrote a short story, *The Care of George Dedlow*, which combined psychological and physiological crises in its main character. It was first published in the *Atlantic Monthly (The Atlantic magazine)*, an American literary and cultural magazine founded in Boston in 1857 by a group of writers who included Ralph Waldo Emerson and Oliver Wendell Holmes. Although he continued in medical practice until his death, his later years were associated with a prolific literary output, including 19 novels, seven books of poetry, short stories and a biography of George Washington. The historical novels of *Hugh Wynne* in 1897 and *The Adventures of Francois* in 1898 achieved great popular success. The novel *Westaways* was written by Mitchell in his 80s and graphically describes the horrors of Gettysburg and its consequences. His fictional works display detailed characterization which reflects his experience of clinical observation of patients. His most popular poem, 'Ode on a Lycian Tomb', written about his daughter who died in 1898 from diphtheria, is the most poignant and is considered one of the finest elegiac poems written in America.

Fair worshipper of many gods, whom I
 In one God worship, very surely He
 Will for thy tears and mine have some reply,
 When death assumes the trust of life, and we

Hear once again the voices of our dead,
And on a newer earth contented tread.

Doubtless for thee thy Lycian fields were sweet,
Thy dream of heaven no wiser than my own;
Nature and love, the sound of children's feet,
Home, husbands, friends; what better hast thou known?
What of the gods could ask thy longing prayer?
Except again this earth and love to share?

From 'Ode on a Lycian Tomb'
Silas Weir Mitchell, 1899 (Wood and Garrison, 1920)

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Selected quotations

1. Keen, Morehouse and I worked on note-taking often as late as 12 or 1 at night, and when we got through we walked home, talking over our cases. I have worked with many men since but never with men who took more delight to repay opportunity with labour. The cases were of amazing interest. Here at one time were 80 epileptics, and every kind of wound, palsies, choreas and stump disorders. Thousands of pages of notes were taken. About midway we planned the ultimate essays which were to record our work. (On his work with Keen and Morehouse in Turners Lane Hospital)

2. The moral world of the sick-bed explains in a measure some of the things that are strange in daily life, and the man who does not know sick women does not know women. (*Doctor and Patient*, Introduction)

3. I know the night is near at hand. The mists lie low on hill and bay. The autumn sheaves are dewless, dry; but I have had the day. (From the poem 'Vesperal', 1899. Bowlin WR ed, *A Book of Personal Poems*, Chicago: Albert Whitman & Co, 1937.)

4. Attending a lady, sick unto death, he dismissed his assistants from the room and then emerged soon after. Asked of her prospects of survival he remarked: "Yes she will run out of the door in two minutes; I set the sheets on fire. A case of hysteria." (Mitchell, 1874.)

5. Mitchell travelled to Paris as a student and again in 1873 and 1875. He met Charcot at the Salpêtrière in 1875. At their initial meeting, Mitchell at first did not identify himself and Charcot remarked: "You have a man in Philadelphia who knows more about run-down nervous conditions than anyone else I know of, and I will give you a letter to Dr S Weir Mitchell, whom you must consult." Mitchell then identified himself and handed him his card. (Tucker BR, *S Weir Mitchell*, Boston: Richard Badger, 1914.)

Bibliography

De Jong RN (1982) *A History of American Neurology*. pp. 14-21 New York: Raven Press.

McHenry LC (1969) *Garrison's History of Neurology*. pp. 327-329. Springfield: Charles Thomas.

McHenry LC (1985) The birth of American neurology and highlights from the first 100 years of the Philadelphia. Neurological Society 1884-1984. *Neurology* 35:1326-1330.

Mitchell SW (1869) Researches on the physiology of the cerebellum. *Am Jnl Med Sci*, Philadelphia, 51: 320-338.

Mitchell SW (1872) *Injuries of Nerves and their Consequences*. Philadelphia: JB Lippincott.

Mitchell SW (1874) The supply of nerves to the skin. *Philadelphia Medical Times*, 4:401-403.

Mitchell SW (1874) *Fat and Blood: an essay on the treatment of certain forms of neurasthenia and hysteria*. London: JB Lippincott.

Pearl E (1999) Causalgia, pathological pain, and adrenergic receptors. *Proc Natl Acad Sci USA*, 96:7664-7667.

Wood CA, Garrison FA, eds. (1920) *A Physician's Anthology of English and American Poetry*. Oxford: Oxford University Press.

Silas Weir Mitchell: <http://www.whonamedit.com>

The Atlantic magazine: <http://theatlantic.com>