Almost a century ago, on August 22, 1906, Sir Victor Horsley presented an address to a combined meeting of the British and Canadian Medical Associations in Toronto, “On the Technique of Operations on the Central Nervous System.” For this lecture, which is described by Paget, his biographer, as one of Horsley’s most important writings, he had arranged a photograph of his operating room at the National Hospital, Queen Square (Fig. 1). The photograph shows Horsley on the left, in his surgical gown and gloves. On the right stands Prof. Emil Theodor Kocher of Berne, one of Harvey Cushing’s teachers, who 3 years later would receive a Nobel prize for surgical studies on the thyroid, a field in which Horsley had also made important contributions. The anesthetist Dr. Powell uses the Vernon Harcourt apparatus to deliver a measured mixture of chloroform and oxygen to the patient. Facing him is the young neurologist Kinnier Wilson, who 6 years later would publish his definitive description of lenticular degeneration. Only Horsley wears a mask; his bulky gown conceals a sterile abdominal dressing, worn in preparation for an elective appendectomy that he would undergo the next day. With respect to this, William Osler wrote on June 12 from Oxford to one of his Canadian colleagues,

Horsley was operated upon for appendicitis last week. It had been an old trouble and I do not think it will interfere with his trip [to Toronto], though Lady Horsley said their plans were somewhat uncertain (Fig. 2).

Osler’s plans for that summer of 1906 were even more uncertain; just 1 year before he had moved with his wife and their boy from Johns Hopkins to Oxford University to take up the prestigious Regius Professorship in Medicine (Fig. 3). He had booked an August passage to the meeting in Toronto, but in the midst of hectic renovation plans with Mrs. Osler for their new home at 13 Norham Gardens, he postponed and, at the last minute, canceled his trip to Canada, missing Horsley’s address.

Nevertheless, in July of the next year at a meeting of the British Medical Association in Exeter, Osler heard Sir William Macewen (Glasgow) and Mr. Donald J. Armour (London) review “The indications for operation in cases of intracranial tumor.” A lively discussion followed. Osler’s own participation was described in the Lancet.

Historical vignette

Osler and the “medico-chirurgical neurologists”: Horsley, Cushing, and Penfield

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During his time at McGill University from 1871 to 1884, Osler performed more than 1000 autopsies. His pathological reports covered the topics of cerebral aneurysm, apoplectic hemorrhage, vascular infarction, subdural hematoma, meningitis, multiple sclerosis, cerebral abscess, and brain tumor. He wrote about cerebral localization and anatomy and the relationships between the morphological characteristics of the brain and intelligence and criminality. During his continuing career at Philadelphia and Baltimore, Osler published widely on problems in clinical neurology, including monographs on cerebral palsies and chorea as well as chapters on disorders of the nervous system in the first five editions of his popular textbook, The Principles and Practice of Medicine. He became familiar with many of the outstanding figures in medical neurology of his time.

Regarding neurosurgery, Osler commended the pioneer operation for a brain tumor in 1884 by Rickman Godlee and the surgery for epilepsy in 1886 by Horsley. In 1907, in discussing the state of brain surgery as reviewed by Horsley, William Macewen, and others, Osler made a plea for “medico-chirurgical neurologists, properly trained in the anatomical, physiological, clinical and surgical aspects of the subject.” He played a significant role as a referring physician, mentor, and friend to his young colleague Harvey Cushing (later to become Osler’s Boswell), who was breaking new ground in neurosurgery at Johns Hopkins Hospital. Beyond that Osler became an inspiring hero figure for his Oxford student Wilder Penfield, who a few decades later would establish a neurological institute at McGill University where medico-chirurgical neurology would flourish.

Key Words • Harvey Cushing • Victor Horsley • William Osler • Wilder Penfield • neuropathology • neurosurgical history
Professor W. Osler (Oxford) held that a great deal of scepticism in regard to the value of operation in cases of cerebral tumor was the result of the bicipital condition of neurology. He deprecated operation in these cases at the hands of general surgeons and would prefer to see neurology a special department, so that there would not be neurological physicians and surgeons, but medico-chirurgical neurologists properly trained in the anatomical, physiological, clinical and surgical aspects of the subject.

In reply, the neurologist Dr. Risien Russell (London) stated that he “was very glad that Professor Osler had emphasized the necessity for specialist neurological surgeons.”

In considering an earlier surgical procedure performed at Regents Park Hospital for a tumor in the hand area of the motor cortex and reported on by Hughes Bennett and Rickman Godlee in 1884, Osler referred to a case he had attended in Montreal in 1883 in which the autopsy revealed a small, almond-sized glioma just beneath the left motor cortex. The patient, a physician’s daughter who was 15 years and 9 months old, had suffered from intermittent jacksonian seizures for 14 years; they had begun in her hand and then spread to her leg and face. She died in the hospital in status epilepticus. This was one such instance, Osler wrote, “in which an operation would have been justifiable and possibly have been the means of saving life.”

Osler’s comments on the example of a fibroglioma of the motor cortex in a young woman epitomizes the pattern of case studies he pursued during his period in Montreal. First, he introduced the living patient and discussed the clinical diagnosis before the Medico-Chirurgical Society. Later, after the patient had succumbed, he would display to the same Society the autopsy specimens together with the gross and microscopic pathological findings. Between 1874 and 1884, he presented more than 90 pathological cases to the Society. Many specimens were labeled and preserved in sealed glass jars for McGill’s Medical Museum (where some remain to this day). Next, he published in extenso the clinical and pathological results of the case in Canadian, British, or American journals. At the same time, he might compose an editorial commentary to place the case within the context of current practice. From 1892 onward, he would also cite the topic in his textbook The Principles and Practice of Medicine.

In 1889 Osler issued a report entitled “On the conditions of the brain suitable for operative interference.” In this early writing, he assigned to the province of the physician “the responsibility of deciding the location of the lesion, its probable nature and the suitability of the case for operation.” Based on cases in which he had performed autopsies and the dreary litany of high mortality rates quoted in the surgical literature, he decried operations for tuberculous sarcomas, carcinomatous growths, rapidly growing vascular gliomas, and hemorrhagic lesions, but favored surgery for slowly growing cortical gliomas and abscesses. He wrote optimistically that
of all intracranial growths, the one most favorable for opera-
tion is not truly a brain tumor but a fibroma of the membranes,
growing usually from the dura, and compressing the brain sub-
stance.68

Osler and Horsley

“One of the most interesting aspects of modern surgery,”
Osler stated, “relates to the treatment of epilepsy, Jacksoni-
an and idiopathic.”68 He noted several instances reported by
Horsley of early surgical successes in three patients with fo-
cal epilepsy, that is, two with posttraumatic scars and one
with a tuberculoma.36,39,88 But he cautiously added that
time alone will determine how far this procedure is justifi-
able, and whether the cortical scar left after removal of the
[irritative] centre may not itself prove, as it so often does in
traumatism, a source of irritation.68

Osler referred to Horsley’s first successful removal of a
spinal cord tumor in 1887 as

perhaps the most brilliant operation in the whole history of
surgery. His victory was won. The young physiologist trained
in surgery by operating on monkeys, had done what had hardly
been dreamed of a generation earlier.71

This patient’s problem was correctly diagnosed by Wil-
liam Gowers, but Horsley’s persistence was paramount—
he had to extend the laminectomy two times to expose and
remove the tumor.43,44,75

Early in his career in 1881, while attending the Seventh
International Medical Congress in London, Osler sat in on
an animated discussion of cerebral localization by Ferrier,
Hughlings Jackson, Brown-Séquard, Horsley, and others.62
Osler was well aware of Horsley’s work on experimental
myxedema in monkeys when he visited him in 1885 at the
Brown Institution and reviewed this research.74 Later, in the
summer of 1894 on another trip to London, he reported,

I went with Horsley to a private operation on Friday. He
took out a dural sarcoma about the size of his fist which had
been growing for fifteen years & caused fits supposed by a
long series of neurologists to be truly epileptic.74

In 1904 Horsley added his approval to that of many oth-
ers to support Osler’s appointment as Regius Professor at
Oxford.14

Sir Victor Horsley died tragically from heat stroke while he
was serving in the British Army in Mesopotamia in July
1916.44,45 In an obituary, Osler noted that Horsley “com-
bined the experimental physiologist and the practical sur-
geon in a degree unequalled since John Hunter.” “But,” Os-
ler added,

what demon drove a man of this type into the muddy pool
of politics? A born reformer, he could not resist. Fearless, dog-
matic, and assertive, once in a contest no manna-dropping
words came from his tongue.72

As Osler lay ill in Oxford during the last days of his own
life, he pencilled a charming and sympathetic review of Ste-
phen Paget’s study of Horsley’s life. His last bit of writing
for publication, it appeared in the January 23, 1920, issue of
the Oxford Magazine.72 He approved the biographer’s criti-
cal evaluation of Horsley’s immense contributions to brain
surgery, cerebral localization, and thyroid disorders. At the
same time, Osler was saddened by Horsley’s alienation of
friends by his furious public forays against alcohol, tobac-
co, and social inequalities, however much he accepted the
sincerity of Horsley’s motives.

To F. H. Garrison on November 15, 1919, Osler had
written,

Horsley’s Life just out and well done of course by Paget—
but what a tragedy! Why could he not have collected umbrella
handles instead of going into politics.14

Osler and the Neurologists

Osler’s writings on general neurology ran to some 200
articles of his total bibliography of more than 1400 works.25
They have been reviewed in detail by the Oxford neurolo-
gists Matthews46 and Ebers21 as well as by Pandya76 more
recently. Osler also became familiar with the work of the
leading neurologists of his day. On reviewing Weir Mit-
chell’s Lectures on Diseases of the Nervous System, Espe-
cially in Women (1885), Osler wrote that the manage-
ment of severe cases of hysteria “by seclusion, rest, massage
and feeding has proved so remarkably successful in the hands
of the author and others.”71 He also reviewed William Gowers’
Diagnosis of Diseases of the Spinal Cord (1883) as well
as his Manual of Diseases of the Nervous System (1888),
which Osler admired as “the most solid contribution to sys-
tematic neurology produced by the British School and . . .
unrivalled in any language.”74,75 In Osler’s great textbook of
1892, The Principles and Practice of Medicine, he cites
Gowers (60 references), Charcot (27 references), and Weir

![Fig. 2. Photograph of Sir Victor Horsley by A. Tear, 1901. Cour-
tesy of the Wilder Penfield Archive.](image)
Mitchell (24 references) more than any other medical authors of his time.31 Osler had attended Jean-Martin Charcot’s theatrical clinics at the Salpêtrière and commented on the American edition of his lectures (1878).49 He dedicated his own monograph *The Cerebral Palsies of Children* (1889) to Weir Mitchell “in recognition of his work in scientific medicine and in grateful acknowledgment of innumerable acts of friendly service.”56 Weir Mitchell responded, “Many thanks my dear Osler—I shall read it—you are always readable not all are—My love to Mrs Osler.”

The dedication in his second neurological book, *On Chorea and Choreiform Affections* (1894), to Gowers read,

> To the profession of the United States and Canada you stand as the most brilliant exponent of the complex science of neurology. Please accept this dedication of this little volume as an earnest of the gratitude felt toward you by thousands of your kinsmen across the water and as an expression of the personal attachment of Your sincere friend, The Author.65

Gowers’ note from Cavendish Square, now folded inside Osler’s copy of the book in his library, began, “The dedication of your little book to me would be one of the pleasant things of life.” During one of his early “quinquennial brain-dusting” trips to England in 1878, Osler later noted, “At Queen Square I began a long friendship with that brilliant ornament of British medicine, Gowers.”14

Eventually, Osler would compose gracious and perceptive obituaries for Charcot63 and Weir Mitchell,71 who represented the best in their specialty from France and America, respectively. He came to know other distinguished French neurologists, including Dejerine and Marie. It was on a visit to Paris in 1905 that Pierre Marie showed Osler a medal of Charcot’s likeness and persuaded Osler to sit for the sculptor Frédéric Vernon, who created a fine bas-relief medalion.40 This was later cast in enlarged form for the centerpiece of the Osler Niche in the Osler Library at McGill University.

**Osler, the Neuropathologist**

During more than a decade in Montreal (1871–1884), Osler performed in excess of a thousand autopsies, beginning when he was a medical student, but mostly while he was a pathologist for the Montreal General Hospital.2,14 These autopsies provided many examples of intracranial lesions,28 and Osler’s reports ranged over the topics of cerebral aneurysm, apoplectic hemorrhage, vascular infarction, subdural hematoma, meningitis, multiple sclerosis, cerebral abscess (especially those due to tuberculosis and syphilis), and brain tumor.1,33 While in Philadelphia from 1884 to 1889, Osler’s busy involvement in medical practice and teaching reduced his time for pathological investigations, but he nevertheless performed another 162 autopsies.1 According to one of his associates, he sometimes performed as many as seven autopsies in 1 day20 (Fig. 5). He continued to mine the rich lode of clinicopathological material derived from his Mon-
treal era for his teaching, lectures and papers, and groundwork for his textbook.

He published examples of other types of brain tumors: a medullary neuroma of the brain, another odd glioma wrapped around the brainstem, and a case of cholesteatoma of the floor of the third ventricle containing characteristic cholesterol crystals. An experienced microscopist, he produced elegant drawings of the cellular elements of these tumors (Fig. 6).

Osler's broad interest in the pathology and clinical diagnosis of aneurysms extended to those on the cerebral arteries. In an unpublished sketch found in 1928 by his bibliographer, Dr. William Francis, Osler diagrammed the classic distribution of 10 aneurysms, with more located on the anterior and middle cerebral arteries than on the posterior system (Fig. 7).

In a major report delivered to the Pathological Society of Philadelphia in 1885 but based on cases “nearly all of which occurred at the Montreal General Hospital,” Osler wrote, “aneurisms of the branches of the Circle of Willis play an important part in the history of cerebral hemorrhage. . . .” and added that “they are certainly more common than the statements of textbooks would indicate. . . .” He further noted that six of the 10 aneurysms reported had burst and caused fatal hemorrhage, whereas four were found accidentally without producing any symptoms. On his evidence, this lesion was hardly “a condition for operative interference,” (Harvey Cushing might have agreed, but not Walter Dandy.)

Osler, the Neuroanatomist

In the course of his pursuit of brain pathology, Osler became a first-rate neuroanatomist. The minutes of the 1879 annual meeting of the Canada Medical Association held in London, Ontario, read as follows:

On the morning of September the 11th, Dr. Osler of Montreal, gave a description of the anatomy of the brain, illustrating his remarks by specimens preserved by Giacomini’s new process.

In August 1882, he also demonstrated this method for the American Association for the Advancement of Science at Montreal. It involved successive stages—immersing the brain first in 50% zinc chloride, second in commercial grade alcohol, and third in glycerin, followed by applying a coating of gum-elastic varnish. This produced a useful, dry demonstration specimen that looked “like a beautiful wax model.”

This interest in brain anatomy, which had included comparative anatomy, attracted Osler’s attention to an 1881 monograph on the brains of criminals. The author, Moriz Benedikt of Vienna, proposed that certain aberrations in convolutional patterns—the presence of more confluent fissures and four horizontal frontal gyri—characterized the criminal brain. Osler reviewed 34 brains from the autopsy service at the Montreal General Hospital and compared the pattern of cerebral fissures with that in the brains of four
Osler and medico-chirurgical neurologists

Osler and Cushing

Osler was a strong protagonist for Harvey Cushing’s aim to develop neurosurgery as a specialty at Johns Hopkins Hospital in the early 1900s. As Barondess, Canale, and others have pointed out, Osler kept a close paternalistic eye on Cushing and his ambitious ego. In 1898 Osler complimented a paper written by Cushing on intestinal perforation in typhoid fever by calling it an “A.A.I report!” Nevertheless, he firmly suggested adding to the paper the names of the house physician, the clinic clerk, and the house surgeon who had been in charge. (Cushing paid no heed to this friendly advice: four papers on this topic carry his name alone.) In another note written early in 1902, Osler admonished Cushing for not getting on well with his surgical subordinates and colleagues and for criticizing staff members in front of the students. Cushing’s response to Osler is not recorded, but he may have threatened to resign (as he had threatened earlier because of his stormy relationship with his surgical chief William Halsted); Osler likely answered, “You will do nothing of the sort.”

Cushing was fortunate enough to travel with Osler on several trips abroad. On one of these voyages, which took place in July 1904, the talented Cushing used his pen to depict himself and Osler in successive daily postures in their berths. Cushing’s main occupation was to enjoy the sea voyage by eating and sleeping. Always the first awake, Osler spent mornings working with books and papers from the rack of his berth. In the sketch “to illustrate ‘sea, sleep and obesity,’” Cushing’s increasing avoirdupois in the upper berth gradually encroaches on Osler’s space in the lower bunk (Fig. 8).

In 1904, repeating Horsley’s earlier pioneer effort, Cushing performed his first operation for a benign spinal tumor on a patient from Osler’s service. This must have come as a welcome surgical success among a series of patients with dishearteningly high mortality rates after craniotomy for brain tumors. In a rare instance of surgery performed out of town in the same year, Cushing undertook a procedure in Montreal in a patient referred by Osler for the treatment of trigeminal neuralgia. Cushing reported on his successful se-
ries with this pain-relieving operation to the Medico-Chir-
urgical Society.16 His audience would have included many
of Osler’s former McGill colleagues and students. His visit
caused quite a local frisson.24

In March 1911, after a 2-month excursion up the Nile to
view the Egyptian temples, Osler stopped at Naples on his
way back to England. He wrote “to one of his old neigh-
bour at 3 West Franklin Street” [Harvey Cushing]:

I dreamt of you last night as operating on Hughlings
Jackson. The great principle you said in cerebral surgery is to
create a commotion by which the association paths are restored.
You took off the scalp/like a P.M. incision/made a big hole
over the cerebellum & put in a Christ-Church [College, Oxford]
whipped-cream wooden instrument and rotated it rapidly. Then
put back the bone and sewed him up. H.J. seemed very com-
fortable after the operation and bought three oranges from a
small Neapolitan who strode into the Queen Square
Amphitheatre!14

Another Oslerian dream that involved rather bizarre spinal
surgery was recorded by Roland.19

Cushing wrote the section “Diseases of the Nervous Sys-
tem” for the sixth edition of Osler’s textbook published in
1906.10 Cushing’s skillful artistry often embellished his neu-
rosurgical papers. Sometimes he drew the heads of patients
to resemble his colleagues, as in his chapter for Keen’s Sur-
gery: Its Principles and Practice (1908), in which the illus-
ination of a craniotomy performed in a patient with a gun-
shot wound damaging the motor cortex, unmistakably de-
picts, as Canale and Ecker have noted, the profile of Wil-
liam Osler.21,15,23 The striking resemblance is more evident
when compared to the Vernon plaque (Fig. 9). It was a lug-
rious neurosurgical compliment, tinged with the hoaxing
flavor of Osler’s alter ego, Egerton Yorrick Davis.32

Osler and Cushing became firm friends, with their com-
mon bond a scholarly interest in medical biography and an
avid love of books.5,7,30 Geoffrey Jefferson graciously as-
sessed Cushing’s ties with Osler.

The friendship which sprang up between the two proved to
be a vital factor in his life, and probably no less in Osler’s . . .
No special reason requires to be shown for matters of feeling;
not the least was that they just liked one another a lot. They
shared ideals in the meaning and the uses of the medical life in
its highest intellectual plane, as well as at a humanitarian level,
as the similarities of their writings on these subjects show.41

In his astute examination of the Osler–Cushing relation-
ship, Barondess notes,

One should perhaps not find it surprising that these two men
developed a friendship of such complexity and warmth, despite
the differences in age and status when they first came to know
one another, for, in fact, they held common values and interests
of immense importance that bound them to each other, quite
possibly each as the best friend the other ever had.4

After Osler’s death in 1919, responding to the invitation
of Lady Osler, Cushing spent 5 years writing his monumen-
tal opus, *The Life of Sir William Osler.* Published in two volumes, it was awarded a Pulitzer prize for literature. Arnold Klebs, Cushing’s admiring bibliographic friend, called it “. . . the happiest fusion of the objective and subjective that biographical art has ever turned out in our rich literature.” Recognized as one of the great medical biographies, it has sustained for many readers the tradition of the persisting Osler (Fig. 10).

**Osler and Penfield**

In 1915 Wilder Penfield travelled as a Rhodes Scholar from Princeton University to Merton College, Oxford. After he had unpacked the Osler and McCrae seven-volume set of *A System of Medicine,* Penfield noted in a letter to his mother,

> Osler was a hero to me before I met the man. When I look up at the seven volumes of Osler’s Medicine on my shelf it makes me, mentally, worship him. It does not seem possible that he can be the same middle-aged man I saw last Sunday, who, with a room full of guests, spent most of his time in pretending to bandage up the leg of a young officer, to the glee of two little children.82

Like his Merton classmate Wilburt Davison before him, Penfield sought Osler’s help in shortening his Oxford course so that he would not need to spend 3 years before returning to Johns Hopkins to finish his medical degree.8 Two members of the physiology department had said, “It can’t be done.” Osler promptly told Penfield, “Certainly you can do it in two years here” adding, “I can fix up any additional courses you need to take at Edinburgh.”78 Penfield thus completed the anatomy dissection course during the late summer of 1915 in Edinburgh. He maintained his spirits by reading Osler’s collection of essays entitled *Aequanimitas,* on the flyleaf of that collection, years later Penfield added a sketch drawn by the mother of one of his patients of Osler’s baronial arms (Fig. 11).

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This first brief encounter with Osler left a deep impression on Penfield, which he recalled many years later, in 1971, in a dinner address to the Charaka Club in Montreal after their visit to the Osler Library. Entitled, “William Osler, the Man I Remember,” it began,

> How can I help you to know this simple, unpretentious man? How make you see and hear him saying good-bye to an anxious student, opening the door for the young man, reassuring him with a few words, approving the plan he has made for a lifetime, and sending him off on his bicycle through the rain with renewed courage and the warm awareness that he has a friend?83
On another occasion at Oxford’s Radcliffe Infirmary, Penfield volunteered to start an autopsy for the pathologist. He wanted the brain removed—and he was called out for a moment. As I started my first autopsy, I realized that someone had come into the room and was looking over the heads of the students around me. A little later I heard Sir William’s voice. “That’s splendid, wonderful. It’s always best to do a thing wrong the first time!” In no time Osler had his coat off, sleeves rolled up, gloves on, and was showing me how to do it right. What I am leading up to is the fact that he was immediately interested in who this patient was: what about the family? What about the situation? What did his death do? And then he made you feel that you were doing something, after all—it was the most important thing in medicine because you were putting yourself in the position of saving the next person or at least understanding the next patient you met. In that one morning exercise—aside from learning a little technique which might be important—the big thing was his human attitude toward the procedure.19

In March 1916 Penfield planned to work as a medical student in a Red Cross hospital in France. The SS Sussex, on which he was crossing the channel, was torpedoed by a German submarine. It was a close call for Penfield, but he was fortunate enough to be rescued from the still-floating hulk and transported to a military hospital in Dover.80 After his recovery from a shattered knee, he spent 2 weeks at Lady Osler’s invitation convalescing at 13 Norham Gardens, Oxford. Penfield described this as “the most wonderful stroke of fortune.” Here Penfield was exposed day after day to Osler’s lively conversation, to samples of his famous library, to Osler’s reading aloud of Creators, Transmuters and Transmitters,58 an address relating Shakespeare, Bacon, and Burton, which he was preparing for the Bodley exhibition to celebrate the 300th anniversary of Shakespeare’s death. Pampered by Lady Osler, Penfield thoroughly enjoyed the general ambiance of this hospitable home with its pleasant outlook on the garden and the university parks.82 Penfield’s privileged experience with Osler and his family proved most inspirational; Osler became his persisting hero figure.77

When he returned to finish his medical course at Johns Hopkins, Penfield conducted a project that showed that gum arabic could partly replace blood in dogs suffering from experimental hemorrhagic shock. A reprint sent to Osler received the reply:

That is a very nice paper—congratulations. When you are an old man—no hurry—you will look on it with much pleasure. It is always nice to start with something good.19

In a touching tribute, Penfield described his final circumstances involving Osler.

In 1919, I went back to Oxford, this time as a graduate student in physiology. Thus, Mrs. Penfield and I arrived with two children during Sir William’s last illness. He died and they took him away from 13 Norham Gardens to Christ Church College. I followed the coffin across the quadrangle and sat alone at the back of the cathedral. It was cold, as only an Oxford cathedral can be cold in December. I remember the service vaguely; I was leaning against the stone wall while someone at a lectern high in the shadows above us said that the man who was dead had been “a friend of all young men.” “And so he had,” I thought. “God bless him.” And I was losing that friend.
Osler and medico-chirurgical neurologists

But strange to say, it was not so. Even today, the “warm awareness,” that I had a friend, which came to me on the day of our first meeting, lingers on. He is one of my heroes, and heroes are important19 (Fig. 12).

Throughout his career, Wilder Penfield continued to take Osler as the model for his professional life and, in many ways, his personal life. He produced many talks and numerous essays on the life and teachings of Osler.79,81,84 At McGill University, Penfield became an ardent supporter of the Osler Library as a member of its Board of Curators and as Honorary Osler Librarian. In one of his essays, “A Medical Student’s Memories of the Regius Professor,” he recounted, “If I summon before me my highest ideals of men and medicine, I find them sprung from the spirit of Osler”78 (Fig. 13).

At Wilder Penfield’s invitation, Harvey Cushing gave one of his finest lectures at the opening of the Montreal Neurological Institute in September 1934.11,85 Cushing referred to Osler’s influence in directing the Rockefeller fortune toward medical research. This came about, as he described it, because Frederick Gates, a Baptist business confidant of John D. Rockefeller, was energized by reading Osler’s textbook of medicine in 1897 and persuaded Rockefeller, one of the richest men in the world, to direct his fortune to medical research and later to medical education.14 Cushing also reminded his McGill audience that it was Osler’s direct appeal to John D. Rockefeller, Jr., in 1919 that resulted in a matching grant of $1 million to modernize McGill’s Medical School. The first stage of this project was a new biology building, opened in 1922 by Cushing and Charles Sherrington.13,22 The final stage of the Rockefeller–McGill program was the construction and research endowment of McGill’s Montreal Neurological Institute in the early 1930s, whose founder and first director was Osler’s Oxford student Wilder Penfield.22 The Institute would become Penfield’s greatest legacy, a world center where medico-chirurgical neurology would flourish, vindicating Osler’s wise dictum.26,29,35

Conclusions

Through his studies on the anatomy, pathology, and clinical aspects of the nervous system, William Osler contributed significantly to the field of neurology. His association with eminent neurologists of his time and his direct contacts with leaders in the field of neurosurgery promoted the development of medico-chirurgical neurology.25

Osler’s liberal attitude toward brain surgery stemmed from his awareness of the focal nature of some intracranial lesions examined in his pathological studies. His published reports and editorial comments informed his medical contemporaries about the exciting advances in this young surgical specialty. In a more personal sense, Osler’s spirited humanism influenced the future of neurosurgery through his friendships with Cushing and Penfield, who both warmly declared their intellectual and inspirational debt to him.11,83

Osler’s connections with the renowned medico-chirurgical neurologists Horsley, Cushing, and Penfield illustrate his insight into the growing significance of specialization. Beyond that, however, he viewed the broad fields of medicine and surgery with the ecumenical eyes of a pathologist, clinician, teacher, and humanist.4 The Osler touch still persists today for many who practice the science and art of medicine.5,8 In addition, through his protegés Cushing and Penfield, who both developed international schools of neurosurgery, Osler’s influence reaches into the present generation of medico-chirurgical neurologists.24–26,35,42,86

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