The Legacy of Harvey Cushing
Profiles of Patient Care

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Thieme
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Preface

Neurological surgery is founded in large part on the work of early surgeons such as Horsley and Cushing. Cushing arrived in history just when anesthetic, aseptic, and technical advances had reached the point at which exploration in the human cranium was possible but not necessarily safe or efficient. Cushing's Halstedian conservative personality embedded in his ritual of meticulous handling of tissues was the substance which not only allowed establishment of our discipline but also allowed its further progress in the face of critics.

For Cushing to achieve the dream of establishing and spreading his specialty through his disciples, he needed to first prove the safety of his methods. His patients therefore became the center of his career and their stories, which he carefully recorded, became the diary of neurological surgery in its infancy.

Cushing stored his patient stories in his Tumor Registry. During my fellowship training in epilepsy surgery at the Yale University Department of Neurosurgery, with the generous assistance of Dr. Dennis D. Spencer, I had the privilege of working on the Cushing Brain Tumor Registry. I immediately recognized the value of publishing some of this collection of patient histories. But this was not possible until the Yale Legal Counsel confirmed that publishing these images would not violate patients' confidentiality rights, as the privacy of the patients was of utmost importance.

In the following chapters, the patients' images (originally stored on glass therefore preserving their quality) have been correlated to their hospital history and presented in the chronological order of the date of patient admission or surgery. The reason for the selection of this group of patients was twofold: (1) their images were available in the Tumor Registry and (2) their images carried a special message about their disease. The patients' records have been retyped based on the original patients' charts on microfilm. In the opening paragraph for each patient record under the title "History," we have summarized the presenting symptoms and signs. Similarly, we have inserted short paragraphs in the middle and end of the record to facilitate understanding of the flow of events in the hospital course and during follow-up. The statements of greatest interest are in boldface. In Chapter 3, Meningiomas, Dr. Barker has further discussed the organization of Cushing's patient records in his thorough introduction. For further information, consult Dr. Peter McL. Black and colleagues' The Surgical Art of Harvey Cushing, where the precise format of the patient charts is discussed. In addition, Dr. Wahl has discussed the salient features of the Yale Cushing Brain Tumor Registry in his introduction to this book (page xi).

Cushing often dictated his "special note" before the operative note. He dictated these operative notes usually immediately after surgery, when he knew about the results of his intervention. These notes provide us with a reasonable window on Cushing's decision-making processes and are important features of the present offering.

The current generation of neurological surgeons may understand that the roots of their discipline are found in the stories of these patients. This book is a recognition of the Cushing patients for their gift to neurosurgery. The emotional expression on their faces more than any words convey their suffering and sense of uncertainty. In this book, we witness their suffering and we renew our oath to care for our patients with passion and to honor their trust in our hands.

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Introduction

Harvey Williams Cushing, destined to become the founder of and most important figure in the history of neurosurgery, was born in Cleveland, Ohio, on April 8, 1869. He was of Puritan descent on both sides of his family, and his father, grandfather, and great-grandfather had been physicians. He received a liberal education at Yale, graduating in 1891, after which he studied medicine at Harvard (MD, 1895), followed by a year's internship at the Massachusetts General Hospital in Boston. He then began a surgical residency at Johns Hopkins Hospital under W.S. Halsted.

Cushing always intended to be a surgeon—there appears to be no truth in the story that he first hoped to train in medicine under Osler at Hopkins—but he drifted into neurosurgery more or less accidentally over a several-year period. His route to the brain evolved out of an early interest in problems of anaesthesia in general surgery, which led him to work with cocaine as a local anaesthetic, which led to an interest in nerve-blocking, which led to an interest in problems of facial pain, and in 1900 resulted in his first important publication, a new surgical approach to trigeminal neuralgia, involving a new route to the juncture of the trigeminal nerve and the brain, where he severed the gasserian ganglion.

Cushing did this innovative work before he went to Europe in 1900–01 on a long-delayed wanderjahr to observe old world surgeons. His European diaries show that he found no masters there, no one who could teach him more than he had learned in the United States. On the beautifully symbolic day of July 4, 1906, Harvey Cushing in London watched the world's then-most acclaimed brain surgeon, Victor Horsley, enter a cranium by rongeuring away big chunks of bone. He concluded that Horsley was disappointing, a better researcher than an operator, and abandoned any plans for more work with Horsley. Later that year he found congenial research opportunities under the great Theodor Kocher in Berne, Switzerland, these took him in a direction he was already going.

It was back at Johns Hopkins, between 1901 and 1910, that Cushing developed the techniques that made him the parent of successful neurosurgery. Unsuccessful neurosurgery had many fathers, including Horsley.

Cushing's work at Hopkins was tolerated by his chief, Halsted, who was barely functional in these years because of his ongoing morphine addiction. Cushing's real spiritual inspiration was Hopkins' chief physician, William Osler, an already surgeon-friendly physician, who commented in 1901 that Cushing was opening the book of surgery at a new page.

Like his predecessors, Cushing approached the central nervous system without the aid of imaging, navigation aids, or antibiotics. He succeeded where others failed because he brought to the previously crude and bloody field of craniotomies and craniectomies Halsted's obsession with hemostasis and caution, his own dexterity, patience, and obsessive attention to detail in every aspect of the surgical experience, and a particularly sophisticated understanding of problems of intracranial and vascular tension that he had developed during his European research.

By 1905 Cushing had overcome the bedevilling problem of herniation leading to the development of fungus cerebri. He relied heavily on a
subtemporal decompression procedure that
erelieved intracranial pressure without causing her-

niation, gave important palliative relief to victims
of tumor, and made possible further exploratory
procedures aimed at locating tumors.

By 1908, working only from signs and symp-
toms in the absence of effective imaging technol-
ogy, Cushing was beginning to be able to locate
and remove benign subdural tumors in human
patients—in one case removing a tumor while
talking with the patient. He had a particularly
dramatic triumph in 1910 when he excised a huge
meningioma from the head of Leonard Wood,
former governor of Cuba and ranking general in
the US army.

Also by 1908, Cushing and his students were
developing routes to the pituitary, first in animals,
then in humans. He soon began surgical and cli-
cal treatment of pituitary conditions, and he
began making pioneering contributions to the
understanding of the gland’s physiology, as out-
lined in his 1912 monograph, The Pituitary Body
and Its Disorders. Cushing was the first to concep-
tualize the pituitary’s role in secreting hormones
that influence growth, and, as a pituitary man,
automatically became a pioneer in the murky
field of endocrinology.

By 1910 Cushing at Hopkins had created neu-
surgery as a new subspecialty, with an effective
population of one. His operative results so far
exceeded all others’, including Horsley’s, as to be
non-comparable. In 1913 Cushing relocated to
Boston, to become Moseley Professor at Harvard
and surgeon-in-chief of the new Peter Bent
Brigham hospital. Cushing’s early work in Boston
was twice interrupted by service in World War I,
but in 1917 he published a second major mono-
graph, Tumors of the Nervus Acusticus, which
was the first detailed study of acoustic tumors
and the possibility of their excision.

In France in 1915, then in 1917–18, he did very
extensive battlefield surgery, including being
involved in a futile attempt to save the life of
William Osler’s son, Revere, in August 1917.
Under pressure to process head wounds quickly,
he developed state-of-the-art techniques of
wound debridement. In the final months of the
war he fell victim to the Spanish flu and a con-
sequent polyneuritis, which was probably Gui-
llain-Barré syndrome possibly superimposed on a
form of Buerger’s disease (the latter probably influ-
enced by his heavy smoking).

Trying to rebuild his practice in Boston after
the war, Cushing was hindered by what he felt
was his duty to acquiesce in Grace Osler’s request
that he write a biography of her husband, who
had died in 1919. Cushing’s two-volume Life of Sir
William Osler was published to great acclaim in
1925 and won that year’s Pulitzer Prize for bio-
graphy. Cushing was a brilliant, prolific writer of
both technical and literary works, at least Osler’s
equal as an essayist and stylist.

During the 1920s Cushing operated on several
hundred patients a year, almost exclusively tumor
cases with continually impressive results. By 1930
Cushing had driven his case mortality below ten
percent in an era when most other neurosurgeons
still reported mortality in the range of 30–45 per-
cent. His histological work on tumors with Perci-
val Bailey in the 1920s led to a series of articles
and monographs that established today’s basic
classification of brain tumors. In 1926 Cushing’s
interest in an electric scalpel developed by W.T.
Bowie resulted in the first applications of electric-
ity to neurosurgery. Cushing’s team continued
their study of pituitary conditions, attempted
vainly to isolate growth and other pituitary
hormones, and often operated on dwarfs, acromeg-
atics, and others suffering from pituitary tumors.

By 1931 Cushing and his surgical team had
operated more than two thousand times for brain
tumors. Cushing stood to neurosurgery as Henry
Ford did to the automobile, Sigmund Freud to
psychoanalysis, the Wrights or Lindbergh to avi-
ation, Ty Cobb or Babe Ruth to baseball, Louis
Armstrong to jazz. The surgical world had
flocked to Cushing’s operating room to study
how he worked on the brain, and he almost sin-
gle-handedly trained the first generation of effec-
tive neurosurgeons who then fanned out across
North America and Europe to begin a new spe-
cialty. He was also a founder and inspirer of pro-
fessional organizations that exist to this day,
including the then-named Harvey Cushing Soci-
ey (currently the American Association of Neu-
rological Surgeons).

In a spectacular last hurrah before retirement,
Cushing in 1932 brilliantly synthesized clinical
observation and theorizing in his paper, “The
Basophil Adenomas of the Pituitary Body and
Their Clinical Manifestations (Pituitary
Basophilism),” in which he outlined what almost