One of the giants of 20th-century medicine—neurosurgeon Harvey Cushing—was bound and determined to pay homage to a seminal American physician who lived a century before him—Dartmouth Medical School founder Nathan Smith. It’s a saga filled with historical coincidence.

On April 26, 1638—18 years after the Mayflower’s departure for the New World—the 350-ton Diligent of Ipswich set sail from Gravesend, England. Captained by John Martin, the ship carried 133 passengers. The Diligent made landfall on August 10 in Boston, then proceeded immediately to Hingham, Mass., a South Shore town founded just five years earlier. Among the passengers who disembarked and settled there were Matthew Cushing and Henry Smith.

What kind of relationship they had with each other, if any, is not part of recorded history. But the lives of a direct descendant of each—Dr. Harvey Williams Cushing, the father of neurosurgery and a pioneer in endocrinology, and Dr. Nathan Smith, the founder of Dartmouth Medical School—were destined to connect 300 years later. Both Nathan Smith and Harvey Cushing were giants of American medicine in their own time, Smith in the early 19th century and Cushing in the early 20th century. Proof of the confluence of their careers lies in documents in the Dartmouth archives and in a bronze plaque that now adorns a hallway in the Remsen Building at Dartmouth Medical School.

At the unveiling of that plaque on June 17, 1929, Harvey Cushing explained that by the 1700s, the Smith and Cushing families had both moved from Hingham to Rehoboth, Mass. Then they part...
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In 1809, a young medical student named Ezekiel Dodge Cushings appeared in Nathan Smith's anatomy classroom at Dartmouth Medical School, then all of 12 years old. Ezekiel, though not in Harvey Cushing's direct lineage, sprung from the same Hingham Cushings. Through copious correspondence with his family, Ezekiel was an avid chronicler of DMS's early years. One of his letters, for example, includes one of the most vivid, surviving descriptions of an 1809 "anatomy riot"—an event sparked by public opposition to the practice of human dissection. (That and subsequent similar events may have been a factor in Nathan Smith's 1813 departure from Dartmouth for Yale, where he was instrumental in founding its medical school.)

Ezekiel Cushing also wrote effusively about his Dartmouth teacher. After leaving Hanover to continue his studies at the University of Pennsylvania, Ezekiel compared Nathan Smith's pedagogical skills to those he found in Philadelphia, noting that "Dr. Smith gives infinitely better lectures on surgery than Dr. [Benjamin Rush]." That's high praise indeed, for Rush, as a sign of the Declara- tion of Independence, was a prominent professor of medical theory and clinical practice, while Physick is considered the "father of American surgery."

The ties between the families didn't stop there. David Cushing's son, Erastus earned his M.D. in 1824 from the Berkshire Medical Institute, whose president at the time was one Dr. Josiah Goodhue. It was Goodhue—thanks to a chance 1784 encounter with Nathan Smith, then 22 years old—who had fostered Smith's interest in medicine.

Erastus Cushing and his family moved in 1835 to Cleveland, Ohio. And there, on April 8, 1869, Harvey Williams Cushing was born to Erasmus's son, Henry Kirke Cushing, and his wife, Betsey—the last of their 10 children.

Harvey Cushing's remarkable life was detailed by medical historian Michael Bliss in a superb 2005 biography titled Harvey Cushing: A Life in Surgery. Cushing entered Yale in 1895 and took the required courses in rhetoric, classics, and mathematics, as well as a few electives—including a course in phys- iological psychology that introduced him to the mysteries of the mammalian brain. But he concentrated on more than just his studies during college. Bliss notes that "when Harvey later reminisced about not having worked hard at Yale, it was because he chiefly remembered his extracurricular activities. He was a member of the Yale baseball team, and among his teammates was Amos Alonzo Stagg, later a famous football coach and one of the few individuals elected to the College Football Hall of Fame as both a player and a coach. Cushing, too, was an excellent athlete; a newspaper headline read "Cushing's Great Sprinting for a Long Fly Starts 10,000 Persons Cheering."

In fact, it was baseball—a Yale-Dartmouth game—that likely brought Cushing to Hanover, N.H., for the first time. However, as Cushing recounted that visit in a 1928 letter to the 11th President of Dartmouth College, Edward Hitchcock, he confessed to having "very hazy recollections of Hanover and its buildings, for it is many years since I have had the pleasure of being in that pleasant little home for a while. The Cushings, in the person of Ezekiel Cushing, were members of the baseball team of which I was an inconspicuous member."

But the story is getting ahead of itself. After graduating from Yale in 1891, Cushing earned his M.D. at Harvard in 1895. He spent a year as a surgical intern at Massachusetts General Hospital and in 1896 was named a resident under Dr. William Halsted, the chief surgeon at Johns Hopkins, and was subsequently put in charge of a new sub-specialty of surgery. Cushing's time at Hop-kins led to close relationships with both Halsted and Dr. William Osler—two of the most famous physicians of the time. (In 1922-23, Cushing wrote the definitive biography of Osler, The Life of Sir William Osler, which won the Pulitzer Prize for biography in 1926.)

At Hopkins, Cushing "opened the book of surgery in a new way," according to Osler. That new place was the brain. Cushing's interest in brain surgery stemmed from a procedure he developed in 1897 to treat trigeminal neuralgia—a nerve disorder that causes intense pain in the face. His subse- quent concentration on brain surgery firmly estab- lished him as the "father of neurosurgery"—togeth- er with, arguably, Dr. Ernest Sachs of Washington University, who was father of Dr. Ernest Sachs, Jr., the longtime chief of neurosurgery at Mary Hitchcock Memorial Hospital.

By 1902, Cushing had developed an interest in the pituitary gland. To explore the size of a pea at the base of the brain, it secretes hormones that control numerous bodily functions. Cushing called it the "stewsony gland." He performed his first transphe- noidal removal of a pituitary tumor—through the sphenoid sinus, behind the nose—in 1909. That patient had acromegaly, an overproduction of a growth hormone by the pituitary. In 1910, he im- proved on the technique by using a sublabial ap- proach—entering through the upper lip instead.

In 1912, Cushing published a book titled The Pituitary Body and Its Disorders. Clinical Pro- duced By Disorders Of The Hypophysis Cere- bros, which remains a triumph of American medical literature. It gives case histories of 48 patients with pituitary tumors. Among them was Minnie G., a 23-year-old female with a "syndrome of painful obe- sity, hyperthyroid [excessive body hair], and amen- orrhea [absence of menstruation], with overdevelop- ment of secondary sexual characteristics accom- panying a low grade of hydrocephalus [enlargement of the brain due to an abnormal accumulation of cerebrospinal fluid] and increased cerebral tension."

Describing her condition as a "polyglandular syn- drome," Cushing speculated that it might be "at- tributable to disordered pituitary, adrenal, pineal, or ovarian influences."

It was only much later—in 1932—that Cush- ing concluded, by analogy to other cases, that Min- nie O.'s condition had been due to a basophilic pi- titary tumor which caused an overproduction of cortisol by the adrenal gland. That was the first de- scription of a condition that is now commonly called "Cushing's disease." Yet ironically, Harvey Cushing never operated on the pituitary gland of a patient with the disease that bears his name. (See pages 58 and 59 for more about Cushing's disease.)

The plaque honoring Smith is pictured on the facing page in its first home—"this room" referred to above. Today the plaque hangs in the third-floor hallway of the Medical School's Remsen Building.
The same year that he described the case of Minot—1912—Cushing moved from Baltimore to Boston, joining the staff of Peter Bent Brigham Hospital and becoming the Moseley Professor of Surgery at Harvard. He remained there until 1913, when he retired and moved to Yale. He was named the Sterling Professor of Neurosurgery at Yale but never performed surgery, taught a course, or did any research in New Haven.

Nevertheless, Cushing’s move there was significant in view of his interest in Nathan Smith, given Smith’s role in the founding of the medical school at Yale. Early evidence of Cushing’s admiration for Smith can be found in a 1924 address to the Congress on Medical Education, titled “The Clinical Teacher and the Medical Curriculum.” In it, Cushing railed against the standard medical curriculum and championed the apprenticeship model that was central to Smith’s vision of medical education. “There is much that a present-day medical student might envy in the opportunities offered to a young man of a century ago, apprenticed to such a person, let us say, as Nathan Smith,” Cushing stated. “In our present-day schools of medicine—the so-called ‘clinical’ schools, that is to say—institutions in which the students are satisfied with a modest income, will find ample opportunity for happiness and for the exercise of their talents.” He went on to highlight the many capabilities of the medical profession that were lost in the “indelible imprint of his personality on this, your beloved Dartmouth.”

Cushing was, not surprisingly, the exemplar of medicine. A few weeks before his trip to Hanover, he said in a letter to Vernon: “Can you tell me . . . for what purpose Room No. 6, the northeast corner of the first story of Dartmouth Hall, where Nathan Smith first started medical teaching at Dartmouth, is at present utilized and whether there is any marker on the room or building to indicate the historical association? If not, I would like to have my honorarium for the lecture utilized for the purpose.” It was President Hopkins who responded to the question. He wrote back to inform Cushing that the old Dartmouth Hall had burned down in 1904, so there would be “no essential truth to any marker” but Hopkins did express interest in the idea of a “tablet” commemorating Smith and proposed placing it in the building that had housed the Medical School since 1821. So there had even been construction of the building, which was the first structure in the U.S. built for the purpose of medical education.

On November 20, 1928, Cushing spoke in 103 Dartmouth Hall on “The Ideals, Opportunities, and Difficulties in a Medical Career.” An edited version of his remarks was published in 1929 in a monograph titled The Medical Career, which was widely distributed to Dartmouth premedical and medical students and to LDSM alumni.

Cushing began by reminding the audience that what he may have to say will produce from its members a wide range of reactions. He wrote: “I think you have a perfectly unique opportunity to do a great service to the State of New Hampshire.” He explained that Smith’s acquaintance with Josiah Goodhue was instrumental to the formation of his career in medicine. And, Cushing continued, “I am not at all sure that we nowadays go about our selection of candidates for the profession in the right way, by insisting on an undeserved long preparation in premedical studies before those aspiring to be doctors are ever brought into contact with patients. It is possibly a good way of selecting those who are likely to become medical scientists, but in the process many who have the natural gifts for medical practice are apt to become sidetracked.” Cushing would surely be dismayed by the fact that similar thoughts are heard from present-day premeds, as they struggle through courses in calculus, organic chemistry, and physics.

At his 1928 lecture on careers in medicine, although Cushing said that he “did not set out to make this address center about Nathan Smith,” much of the speech is indeed about the “indelible imprint of his personality on this, your beloved Dartmouth.”

The year 1928 was significant to the history of Dartmouth Medical School. On November 20, 1928, Cushing spoke in 103 Dartmouth Hall on “The Ideals, Opportunities, and Difficulties in a Medical Career.” A revised version of his remarks was published in 1929 in a monograph titled The Medical Career, which was widely distributed to Dartmouth premedical and medical students and to LDSM alumni.

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Cushing even suggested the word: "In Room No. 6, the Northeast corner of the first story of the old Dartmouth Hall, Nathan Smith as Professor of Anatomy, Surgery, Chemistry, and the Theory and Practice of Physic began the teaching of Medicine here November 20, 1797, thereby establishing the fourth medical school to be established in this country." (Cushing erred regarding the date, however. The first DMS classes, in 1797, were taught in a private home in Hanover. It was not until 1799 that the Board of Trustees allowed Smith to use Room 6 in Dartmouth Hall.)

Hopkins responded with an endorsement of Cushing's ideas as to both the medical school's future and the placing of a tablet. "I think too for the expression of your opinion you have given in regard to the Medical School," Hopkins wrote. "It is completely in accordance with my own convictions, and it likewise conforms to my own aspirations for the School. . . . There is no reason in the world why we should not put up a tablet in the northern corridor of Dartmouth Hall with the word of tribute thereupon in appreciation of Nathan Smith which you have suggested."

A tablet honoring Smith was indeed put up only seven months later, though not in the location Cushing suggested. But 40 years would pass before Dartmouth again offered the M.D. degree. Hopkins expressed his support for revitalizing DMS, including in a letter to the American Medical Association's Council on Medical Education, but the Dartmouth Trustees questioned the use of general funds to support a medical school "never having been made or established in the original charter of the College." Hopkins's executive assistant, Robert Strong, wrote a letter to Cushing in January 1929 that attained to the same point as Hopkins's frustration with the limitations of a two-year school. Strong wrote that John Bowler, then DMS's dean, planned to give a copy of Cushing's medical career, DMS's dean, planned to give a copy of Cushing's book, The Sunrise of Medical Science, to every DMS graduate, "as we have not been able to do very much for these men in the way of tying them up with the College, [so] we feel that this is the only excellent way of doing it that has been possible to us, to home them, and particularly to the men who only had a premedical course at Dartmouth, something of the worthwhileness of the school, its fine tradition, and the hope for its future."

On April 3, 1929, Hopkins himself wrote to Cushing to inform him that the Trustees of Dart- 

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above, before her surgery (note the roundness of her face), and below, today. 

That's Pattin above, before her surgery (note the roundness of her face), and below, today. Her tumor is depicted in the top MRIs at left.
A Diligent Effort

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Cushing received the letter on his 60th birthday, April 8, and—in the only hand-written letter to Hopkins in all his correspondence for 1928-29—thanked him for the birthday present. “I am told that 60 is its felicities,” Cushing wrote to Hopkins. “To be taken into the fellowship of Dartmouth, now that Dr. Smith has to this extent over-takes me, I regard as an evidence of the truth of this saying.”

On Monday, June 17—the day before Commencement—students, faculty, and Medical School alumni gathered in the lecture hall of the 1811 Dartmouth Hall building to dedicate a tablet honoring Smith. Both the timing and the location were fitting, for 1929 marked the 100th anniversary of Smith’s death, and Smith had delivered the very first lecture ever given in the building, probably in that very room. The bronze tablet, featuring a bas-relief portrait of Smith, had been designed by Dr. Colin Campbell Stewart, a professor of physiology at DMS who was legendarily appreciated for his artistic skill at the blackboard.

Cushing gave the main address at the dedication. Though neither of his suggestions—as to wording or location—had been followed, and it is unclear whether his 1928 honorarium went toward the tablet’s cost, Cushing’s comments about Smith were gracious and reverent: “For a school, for a generation indeed, for a state, for a church, to have some individual that they can in a way use before the world as a symbol of what they would like to have other people think them to be is the greatest good fortune. . . . And so I think, when a school like your own has some person who has been a person of outstanding distinction—to make use of that person for similar purposes as a means of tying together the sympathies and the interests of individuals and otherwise of a group of people, which graduates represent, ought to be done.”

The following day, Cushing was present at the 159th Dartmouth Commencement. He was lauded by Hopkins as a “great physician and eminent surgeon,”Cushing called in his correspondence for 1928-29—thanks him for the birthday present. “I am told that 60 is its felicities,” Cushing wrote to Hopkins. “To be taken into the fellowship of Dartmouth, now that Dr. Smith has to this extent over-takes me, I regard as an evidence of the truth of this saying.”

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