Harvey Cushing*
General Surgeon, Biologist, Professor

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Dr. Sugar, Dr. MacLaurin, ladies and gentlemen of the Society. It is a pleasure and a privilege to meet with you today and to submit my interpretation of the man in whose honor this Society was founded and who would have been 100 years old last Tuesday.

But I cannot do this without first stating my own regret that my classmate, colleague, staff member, true successor to Cushing, and long-time personal friend, Dr. Donald Matson, cannot be here to share this meeting as President of this Society. It was a conference with him last August (when he was busily planning the details of this meeting) that led to our idea that it might be appropriate for the Moseley Professor of 1969 to speak of the one who was born in 1869. I hope I can fulfill the mission that Don perceived.†

Like a central mountain peak that appears to rise higher and higher above the surrounding foothills as the whole mountain range recedes in the distance, so Cushing's unique stature not only stands the test of time but rises higher with each passing decade. Many have said that he opened up a whole new field of therapy almost single-handedly; I am not sure that he would have agreed to the insertion of the word "almost" in that sentence. In addition, he was valid and literate in several other fields of biological study, had a remarkable impact on people, became the friend of Presidents, artists, and scientists in the international set of the day, became a public figure and noted author, America's most renowned surgeon, and profoundly influenced the public's image and understanding of surgery in America.

Today I would like to look at some of the non-neurological aspects of Cushing and his work, viewed in the perspective of a younger generation that never worked with him or knew him, 75 years since his graduation from medical school, 57 years since he became Moseley Professor, 50 years since he commenced his Life of Osler, and 30 years since his death. I can claim no special knowledge or insight as a basis for discussing Cushing's work merely because I live on the same street, use the same office, conduct the affairs of the same department, or sit at the same desk in the same figurative Chair, looking out the same window at the same street scene while I contemplate many of the same problems. Ours is a generation that came to Harvard Medical School 2 years after he left, and I met him only once and then by a curious mishance that might be worth the telling.

In the fall of 1932, I was a sophomore at Harvard College. A friend's father, a doctor in Wisconsin, had told us by all means to look up his old buddy Dr. Cushing when we came to Boston. One Sunday afternoon we telephoned and with surprising cordiality, Mrs. Cushing said, "Why yes, this is Sunday afternoon and won't you come over." After we had been there a few minutes we noticed that there were preparations under way for a rather large tea party. Several men a good deal older, actual medical students, arrived in large numbers. In the course of our conversation, though Dr. Cushing was very courteous, it became clear that sadly he had never heard of my friend's father. Furthermore, it became increasingly and painfully evident that Dr. and Mrs. Cushing had set up a series of Sunday afternoon receptions in preparation for his retirement, and thought that we were first year medical students! After a little while, we sneaked quietly out. As soon as we got to our room we consulted

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the phone book again. There were three Dr. Cushing. One was Dr. Hayward Warren Cushing. He was my own great uncle so that was obviously not the man. Then there was Dr. Harvey. Finally, there was Dr. Arthur Cushing, a distinguished practicing physician in Brookline. Ah yes, his father had said something about Arthur. So, being mistaken for someone we weren’t and thinking he was someone he wasn’t, we had tea with Dr. and Mrs. Harvey Cushing.

To make this topic manageable, I will divide it into three parts: first, the surgical and technical studies; second, Cushing’s physiologic research and endocrinology; and third, his Departmental Chairmanship.

In the years between entering medical school in 1891 and the end of the war in 1918, Cushing studied, wrote, and lectured on a wide variety of topics. These included basic surgical technique (the Halsted tradition was considerably refined by Dr. Cushing for handling the delicate tissues of the central nervous system), cardiac surgery (in which he was 40 years ahead of his time), saline solutions and tissue electrolytes, surgical bacteriology of the intestinal tract, electro-surgery, blood pressure regulation, local anesthetics (surely he was influenced by his boss on that one!), diseases of animals, typhoid fever, hibernation, and Raynaud’s Disease. If we just stopped there in describing the “impact of Harvey Cushing on American surgery” we would have indicated quite a considerable splash and a very big crater.

He was literally into everything, and wherever there was controversy he was almost always right. That certainly aroused antagonism. One of the best examples of this was the great blood-pressure episode. He had published a paper stating that it was sound practice to measure and record the blood pressure of patients while they were being operated on. This was a further extension of the work he had done as a medical student on anesthesia charts.

“There has been a long-felt want in the surgical operating room, possibly even more than in the clinic, for some practical form of apparatus which will give with facility numerical equivalents for variations in pulse tension, and by means of which consecutive observations on this quality of the pulse may be diagrammatically charted.

“During a critical operation the hearsay dependence which the surgeon must place on the palpating finger of the anesthetist for a knowledge of the cardiac strength of his patient may be oftentimes one of his most trying responsibilities. Were it possible, therefore, under such circumstances for him to be told with definiteness...”

His article implored surgeons to use the Riva-Rocci apparatus, or rather to see that their anesthetists were equipped with it, was written in 1903. Now, there is nothing that the practicing surgeon enjoys less than being told to do something in every case that he is not doing in any case. So this aroused a storm. As you might predict, a Committee was then appointed. This Committee was composed of some of the most prominent members of the surgical staff of the Massachusetts General Hospital. After very careful study they came up with their report that during operations there was no utility to be gained from measuring the blood pressure of patients. This epic report was followed within months by the widespread adoption of the practice, and, of course, the members of the Committee never forgot the episode.

Cushing’s articles on cardiac surgery included experimental and clinical notes on chronic valvular lesions in the dog and the possible relationship of their attempted repair to some future surgery of the cardiac valves in man. At a meeting only a few years ago, I unexpectedly encountered a whole subculture of cardiac surgeons who were totally unaware of this remarkable work. Cushing and his colleagues at the Hunterian Laboratory at Hopkins had examined a dog with ascites and anasarca, made the diagnosis of cardiac valvular disease, probably tricuspid, attempted to do a valvotomy, and then—in the best Cushing tradition—described the whole affair in detail in the literature.

“We wish to mention briefly some attempts which have been made in the Hunterian Laboratory to reproduce chronic valvular lesions, to record certain cases of spontaneous valvular disease in the dog which have come under our observation; and finally to comment on the possibilities of future surgical measures in man directed toward the alleviation particularly of the lesion characterizing mitral stenosis.

“In November, 1905, there was brought
to the laboratory a large Newfoundland dog suffering with general anasarca, ascites, and other sequelae of passive congestion due to tricuspid insufficiency with compensatory failure resulting from advanced chronic endocarditis..."8

Characteristically, forging ahead with surgery both of the thorax and the heart (both of them unheard of clinically), Cushing found and solved a variety of important problems. He soon noted that upon opening the thorax one must take steps to maintain lung inflation or the animal is in severe trouble due to surgically imposed pneumothorax.

"Many points of surgical interest, which I need not fully dwell upon, have necessarily been brought up by these operations. In the first place, upon opening the thorax, some form of artificial respiration is necessary, particularly in the dog, because of the thin mediastinal septum of this animal. Owing to the recent prominence given to the Sauerbruch cabinet and to Brower's apparatus in surgical literature, we would naturally have been inclined to use some positive or negative pressure method of filling the lungs. Some experimental observations, however, undertaken by Dr. Follis in the laboratory at this time with a positive pressure apparatus have led us to doubt whether there was any superiority shown by these methods over that of direct inflation of the lungs by opening the trachea, as commonly used in a physiologic laboratory..."8

Bypassing the bulky, inconvenient methods for handling surgical pneumothorax being initially studied on the continent, Cushing took the current physiologic method directly from the laboratory to this clinical situation, thus anticipating by 20 years the routine use of positive-pressure endotracheal anesthesia. Even though this method later became basic to the development of pulmonary surgery, Cushing made no great point of it; he merely described it in the literature so that others could make use of it if they wished.

The heart had been a fearsome structure to the surgeon, and some had thought it would never bow to any form of surgical manipulation. Cushing wrote:

"Surgeons thus became aware, through animal experimentation, that the musculature of the pulsating organ could hold sutures and would tolerate a considerable degree of manipulation. Indeed, those who have not experimented with surgical measures on the heart of the lower animals can little realize how much handling, dislocation, ligation of coronary vessels and the like will be borne, and how readily an incised opening, even into the cavities, may be made and subsequently closed. It is not such a great step to pass from the treatment by suture of accidental wounds of the musculature to the actual entering of the heart in an effort to attack pathological lesions of the valves themselves..."8

Cushing had his biochemical period. Here again something that began as a casual observation went directly on to penetrating study. He found that pure sodium chloride solutions were injurious to nerve-muscle preparations; characteristically he gave full credit to other workers and to previous laborers in each vineyard.

"It was an accidental discovery in the preparation of so-called physiologic salt solution that, when sodium chloride was added to tap water drawn from a certain source of supply, the solution was more efficacious than the corresponding one made from distilled water. Upon investigation the tap water was found to be rich in calcium and potassium salts.

"To Sydney Ringer is due the credit of recognizing this and of appreciating the significance of the fact that minute amounts of these salts would antagonize the injurious effects upon animal tissues of pure sodium salts alone..."2

Cushing sought to localize this effect that we now would characterize as due to the interaction of various ion pairs on neuromuscular irritability.

"The observations permit the following conclusions:

"The pure sodium-chloride solutions are injurious to the nerve-muscle preparation."

"The effect is in a measure related to the percentage of this salt in solution."

"Inasmuch as the response from indirect stimulation fails, while that from direct stimulation may persist, the result primarily affects the nerve ends."

"The injurious effect may be promptly counteracted by the blood or serum of certain animals or the proper physiologically balanced salt solution."
“By varying the percentage of calcium ion in the solution, with certain limitations, proportionately beneficial effects may be produced.

“An excess of the calcium ion in certain cases of fatigued muscle may lead intra vitam to a permanent contraction of the muscle resembling rigor mortis . . .”²

From this work came the development of “Cushing’s Solution,” still used in the operating room at the Brigham.

Cushing also experienced a bacteriologic period, one of considerable note and regarded by some of his colleagues as an interest which might well have become a career. Cushing became interested in the bacteriology of the gastrointestinal tract and the possibility that alterations in its bacterial flora might make operations safer. His first article was entitled, “Experimental and Surgical Notes upon the Bacteriology of the Upper Portion of the Alimentary Canal, with Observations on the Establishment There of an Amicrobic State as a Preliminary to Operative Procedures on the Stomach and Small Intestine.” This article was by Cushing together with Dr. Louis E. Livingood of the Department of Pathology. Characteristically, Cushing was accepting the challenge posed by an individual patient.

“In the fall of 1897 there entered the surgical wards of the Johns Hopkins Hospital a young man who had received, twenty-seven hours previous to his admission, a gunshot wound of the abdomen . . .”⁶

The peritonitis that followed and the multiple intestinal fistulae posed a severe problem which Cushing and Livingood sought to solve by bacteriologic observations on the fasting state. They demonstrated that in the dog in the fasting state, the bacterial population of the gut was reduced essentially to zero save for a pocket in the cecum which appeared to be the nesting place of the colon bacillus. In planning to make use of this observation, so as to make gastrointestinal surgery safer, Cushing was anticipating by almost 50 years the work of Dr. Edgar Poth of Galveston, who sought to “sterilize” the gut using non-absorbable sulfonamides.

The foregoing are but a few examples of the wide-ranging surgical concerns of Cushing. “General Surgery” might be defined as general education in surgery. Perhaps it is a general concern with all things surgical. In any event, it certainly was a disaster for General Surgery when Cushing abandoned it for Neurosurgery!

And abandon it he did, although always with a backward look, always self-consciously, and always complaining that the generalist was more effective than the specialist, while yet admitting the enigma posed by the special skills of the specialist. From time to time he published an article or two on the progress of his new field, the way a proud father might tell his friends about the progressive youngster.⁴,⁵

In several of his papers Cushing showed that, like so many surgeons, he was sensitive to the needling of the physician who might feel a bit superior to the handwork of those whose profession had previously been practiced by barbers. He enjoyed this constant battle with physicians about the division of responsibility. At the same time he could point out that the most trying responsibilities of physicians sometimes arose from the consciousness that they must protect their patients from the overzealous interest of the “chance operator whose manual facility exceeds his knowledge of disease.”⁴ So you can see Cushing standing in the middle and lashing out at both sides in the battle of internal medicine versus internal surgery, while at the same time straddling the enigma of the generalist versus the specialist. When speaking of his special field, he always paid strong debt to the general surgical nature of his work and the physiologic background.

“I have attempted to elucidate some matters in regard to a branch of surgery which in its present formative stage can only be safely undertaken with the best possible understanding of neurology. The few technical points which I have chosen to emphasize are:

1. The continuous auscultation of heartbeat and respiration during anesthesia.

2. The subtemporal decompressive operation as an early measure in the step preliminary to a possible subsequent tumor extirpation.

3. The dangers of lumbar puncture in the presence of a degree of subtentorial pressure sufficient to produce a cerebello-medullary foraminal hernia.
4. The value of a continuous lumbar drain during the course of exploration for lesions of the hemispheres.

5. The principle of outward dislocation of normal tissue to avoid the risks of compression or mutilation during deep explorations.

6. The satisfaction of such intracranial procedures as the ganglion operation for trigeminal neuralgia when once they are put on a basis of comparative safety."

Turning from this tremendous wealth of clinical, surgical, and technical works to Cushing's research on physiology and endocrinology, we discover a man who demonstrated repeatedly a remarkable property, that of the natural or intuitive biologist. Bronowski, in his writings on science and human values, notes the occurrence of such people. Possibly they are more frequently encountered in biology than in some other branches of science. These are men who through their work acquire enough general understanding about the natural arrangement of things that they intuitively sense how things unknown are ordered. This is not "serendipity." If we had to make a fancy word for it, it should be called "rapporterie," an intuitive rapport with the nature of things. Men who have this ability are able to slice through the pedestrian library-based struggles of lesser mortals and arrive at masterful solutions and new combinations quickly and decisively. Such recent scientific insights as the brilliant use of the primate kidney cell for the culture of polio virus by Dr. John Enders or the steric solution of DNA structure by James Watson and Francis Crick are but two recent examples where persons with some sort of special insight and expertise slice through the nonsense and rapidly reach the effective solution. In the latter example of DNA structure, Watson himself had never done a laboratory experiment on the chemistry of nucleic acids. Much of Cushing's endocrine research has this quality of brilliance, of sudden insights, and of lightly touching matters which then keep others busy.

Cushing's endocrine research, carried out on the side, has kept a whole generation of internists and endocrinologists fully occupied. It was truly a quantum jump to pass from consideration of the peripheral ductless glands (as they were descriptively named at the time) straight on to the surgically exposed, diagnosed, examined, and removed pituitary. Whenever I find myself running second in an argument with an internist over the quality of medical versus surgical research (which is a rather frequent experience) I inquire how many of his colleagues in internal medicine have spent their careers studying a phenomenon first described by a surgeon. This question brings my adversary to a moment of hesitation in his diatribe, and the flick of an inquiring eye. I merely mention "Cushing's Syndrome" and we're ready to move to another topic. In fact, it comes as somewhat of a surprise to many European scientists to learn that the Harvey Cushing Society is a group of surgeons! They consider it a natural eponym for the American Endocrine Society.

Prominent amongst the intellectual facilities which gave Cushing this rapporter in endocrinology was his remarkable ability of clinical recall. Patients' names, faces, histories, pathophysiology could always be arranged in an orderly way, as data retrieval from his ever-lengthening clinical memory. From this memory came the assemblage of the necessary pieces to constitute Cushing's Syndrome. This feature of a clinical memory was strengthened and sharpened as a custom of the period. Cushing learned this skill in part from his father and in part from Osler, and he passed it on to many people, especially John Homans. Clinical recall to form groupings and syndromes is in essence a form of collecting. Several of Cushing's lifelong activities can be gathered together under the general rubric of "collecting." As a youngster, Harvey had started his interest in collections by gathering varieties of trees which he saw around Cleveland, saving the leaves and buds, and looking up the proper biological names. He collected throughout his life. He collected people with whom he carried on an increasingly voluminous correspondence. He collected patients so that not a single one was ever lost to follow-up. He collected likenesses, which he sketched, syndromes which he named, books that he gave to Yale—and in his last 10 or 15 years he gathered together his great collection of brain tumors.
But he did not stop at collecting; he also elucidated, or tried to elucidate, the physiology and mechanisms involved. His thought that Cushing's Syndrome had a pituitary component has found recent confirmation in the development of latent pituitary disease with visual field defects in some patients with Cushing's Syndrome who have previously bilateral adrenalectomy. The body compositional effects of chronic hyperadrenocorticism, the relationship to diabetes, hypertension, suprapituitary control mechanisms, and the meaning of the whole in terms of "stress" have not even yet been elucidated 60 years after Cushing first gathered and assembled the pieces of the syndrome in one description. The eponym "Cushing's Syndrome" shows the inherent chauvinism of medical history; it goes by other names in Russia, in Germany, in France. And yet this in no wise detracts from Cushing's insight and his independent description, elucidation, and operative management.

Cushing had the uncanny ability (which many surgical residents might envy) of working always on the right thing at the right time. He was only in Switzerland a few months (on his first trip) yet he picked the blood-pressure-spinal-fluid-pressure problem. This immediately enabled him to do safer craniotomies and gave a whole generation of physiologists something new to think about: his classic experiment in which, as the spinal fluid pressure of a dog is increased, there is first a vagal effect with bradycardia and then a high rise in arterial blood pressure. His younger associates (some of them in physiology, such as Walter Cannon) picked up these findings that Cushing made in a few months of work and took them back to their laboratories for many years of more elaborate study.

Cushing's principal research achievement was surely as America's first great endocrinologist, as his book on the pituitary showed so clearly. This is a book about which I am rather sentimental because, as I moved into Cushing's office in July, 1948, and looked around in the old bookcases, I found that they had been thoroughly cleared and picked bare, first by Cushing and then by successive generations of raiders and readers. Amongst the few remaining was this interesting and remarkable copy of his greatest book. It is the book in which Cushing entered himself as Professor Elect of Surgery in Harvard Medical School, and where the publisher had to explain to the reader that the "Peter Bent Brigham" was a hospital in Boston, Massachusetts. Cushing received many awards, and in our day he would have been a leading candidate for the Nobel Prize. Both on the grounds of his contributions to neurosurgery, and to pituitary endocrinology, Cushing would have merited the Stockholm trip. In his era, the only surgeon who received the Nobel Prize was Alexis Carrel, another surgeon of the period whose work forecast what will surely be a century of exploitation in the transplant field. It is an interesting contrast that the immediate impact and subsequent development of Cushing's work in neurosurgery was much more obvious in 1915 than was the future cultivation of any ground that Carrel had turned up.

Fulton states that Cushing wrote 10,000 words a day during his 20 years at the Brigham. How much is that? It's about 40 type-written pages. If you take everything that he ever wrote and multiply it by 5 (for the number of drafts it had to go through) and divide by 20 × 365 you do come out with something rather staggering. The contention of 10,000 daily words is hard to prove but it certainly made John Fulton's job a lot easier. Fulton simply had to put all this together end-to-end. Much of it was written by Cushing with a great sense of historic importance. When assembled it made not a biography but an autobiography.

One further feature of his remarkable productivity was that, after 1923, his laboratory was in the operating room. How many of us might envy him now!

In fact, whenever he operated he was killing two birds with one stone. (Dr. Cushing probably would not have appreciated this metaphor!) This makes quite a contrast with the surgical investigator of this day who uses complicated devices, new disciplines, and extensive collaborative teams. He is torn between the laboratory and the operating room. During the last two decades of his active career, Cushing carried out an important experiment (largely in the histology and natural history of cerebral and pituitary tumors) every time that he operated; this
wedding of research and clinical care greatly multiplied his productivity.

Despite these triumphs in surgical and endocrine research, it was as Professor and Department Head that Cushing had the greatest impact on succeeding generations. He was every Dean's model of the perfect professor. Perhaps he was a bit difficult at times (for instance in the great full-time controversy), but as Isaac Walton wrote of the "compleat angler," Cushing was certainly the "compleat professor."

The full-time controversy has been extensively quoted and reviewed and I shall be brief. When he got to Harvard he turned down 1.5 million dollars (somewhere around 5 to 8 million dollars now) in order to stay "free." Did he perceive an important principle here and base his contention on that principle? Or did he see a personal intuitive desire and cloak it in a perfect principle, which made it easily defensible? Those are the kinds of insights into Cushing that we just don't have. With due respect to John Fulton there is none of them in that great book. Someone has yet to look at the motives of this man and some of the important decisions he made and give us a little motivational, psychological, and psychiatric insight. With or without such understanding, every chairman of a university ad hoc search committee after 1930 was trying to find another man who could combine research, clinical work, departmental operation, and teaching as Cushing did—whether in surgery, psychiatry, pediatrics, or medicine. President Eliot had perceived these unique professorial qualities as early as 1908, and is reputed to have said about Cushing, "we want that man up here at Harvard."

Although Cushing worked some with students, it was his operative work that was the center of departmental activity. From the end of his writing the Osler biography in 1923, until 1930, almost 40% of the major operations done at the Brigham were neurosurgical. It is a diversion to look back through the Annual Reports of the Brigham Hospital, that unique set of historical documents. Here we see the Medical Department in 1914, under Christian (with whom Cushing always had a stand-off) and including Francis Peabody (the William Osler of Boston), and Thomas Lewis as "Pro Tem."

Christian had commenced this custom of a Physician-in-Chief Pro Tem, and Lewis was amongst the first. In Surgery we find a listing of Cushing, Cheever, Homans, and Emil Goetsch (the first Surgical Resident, still able to come to our Fiftieth Reunion in 1963). Also there was Walter Boothby, a remarkably strong appointment as a physician-respiratory-physiologist in anesthesia. On the first house staff, there were quite a few interesting people: Cecil Drinker, Sam Levine, John Morton (later professor at Rochester), Gilbert Horrax (one of the teachers of Donald Matson), Elliott Cutler (who took the mitral stenosis ideas to the operating room in 1924), Stanley Cobb (who later went into psychiatry), Marius Smith-Petersen (later Professor of Orthopedics), and Sam Harvey (later Professor of Surgery at Yale). No matter how we pride ourselves on our present roster, I don't honestly think that we have ever gathered such a group of stars together at one time.

We find that Cushing commenced his Annual Reports by trying to establish the tradition of listing each type of operation. Although this was abandoned later, we find in the 1914 Report that 28 operations were carried out on the pituitary! I do not know how many of you as members of the American Association of Neurological Surgeons pursue operative management of pituitary disease; I would think that it was the rare member of this Society who carried out 28 pituitary operations in a year along with lots of neurosurgery! We see an implantation of the parathyroid glands for paralysis agitans. This curious bit arose from the Halsted interest in parathyroid transplantation, pursued a decade earlier at Hopkins, and a sort of intuitive suspicion that, since absence of the parathyroid-produced muscle spasm (tetany), maybe extra parathyroids might help another spastic condition such as paralysis agitans or Parkinson's Disease. We find the deaths listed and analyzed. Many of them, deaths of older people with advanced malignancy, show how little surgery has changed.

Like that of a European Professor, the work of Cushing's Department was built around a large private practice. This is something that many do not appreciate, and Cushing probably would not have phrased it
that way. But that's how it was. He admitted and cared for many private patients each month. He knew and admired the Brothers Mayo and visited their clinic often. He once wrote an article about the Mayo Clinic. He argued extensively with his Cleveland friend, Dr. George Crile. He scarcely admitted the existence of Dr. Frank Lahey. But it was in those years in the early 20th Century that these men built up the three great private clinics that were to become such characteristics American institutions with no counterparts abroad or even in Canada. The great private surgical clinic built around the work of one man (and in the case of the Mayo, Crile, and Lahey Clinics, all established on the basis of superior thyroid surgery) was an institution well-known to Cushing. Cushing's Department was in a sense a private neurosurgery clinic set up in a university hospital. It was thus constructed a little bit on the European University pattern, and a little bit on the pattern of the great American clinic.

Universities have, ever since that time, been looking for another Cushing, looking for a three-way hybrid between Walter Cannon, Will Mayo, and Theodore Kocher. Is this a false quest? Was the principal impact of Cushing to imprint on the American academic mind an impossible and impractical ideal, giving every Dean an impossible dream? Actually, the great scientific work of our day is rarely done by department heads. Of 10 major discoveries at Harvard Medical School in the past 50 years, two of which have won the Nobel Prize, the majority were made by people who were not burdened by running a department at the time of their discovery. Nonetheless, the conviction runs very deep in our academic consciousness that great researchers should be professors. The idea behind the NIH Research Training Programs seems to be one of diverting the young surgeon from the patient, to get him deeply involved with modern quantitative biology in another discipline. The concept that such training will produce worthy people of fine productivity can scarcely be denied; the idea that it will produce department heads and professors is open to question. It is a fine thing to provide such training, but is it to make professors? Will it produce a Harvey Cushing or just a frustrated scientist trying to make do while running a department? Will it produce a Cushing, or a man who has to give up his science or outgrow it in order to do his "job" for the university? In terms of our modern standards both of science and departmental administration, the genius of Cushing must be coupled with an infinite capacity for daily work, to make such a combination workable in the career of one man.

It has been said that the Saint is the man who preaches illusion at no matter what cost to his own inner integrity. Cushing didn't preach much, and yet unwittingly, through his own genius, he has established a tradition that might have turned out to be a myth. Possibly it was a saintly myth; university search committees should continue their fruitless quest for more Harvey Cushings. Such people are surely worth looking for! If we can learn from the history of science, one more genius like Cushing should be born about 2069. Unfortunately, he will probably not be interested in anything as ancient as neurosurgery!

References

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