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NEUROLOGICAL SURGEON

By HENRY R. VIETS

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## Notes on the Formative Period of a Neurological Surgeon\*

By Henry R. Viets

THE three impressions of a medical student's life most likely to be recalled in later years are those associated with the dissection room, the terror of his first unassisted delivery, and the anxiety at the time of his inauguration as an anesthetist. Each has its emotional reactions, patterns that have been repeated in endless variety as the pathways are worn in the pliant mind of the youthful physician. The memories of anesthesia are the most lasting; life and death are held so finely balanced in one's hands. The association is often recalled, sometimes vividly, as was the case with Harvey Cushing in 1920, when old memories were stirred by a friendly correspondence with a medical colleague. To another friend, at the same time, he wrote as follows: "My first giving of an anesthetic was when, a third-year student, I was called down from the seats [Massachusetts General Hospital operation room] and sent in a little side room with a patient and an orderly and told to put the patient to sleep, for Dr. ——— was to operate for the class. I knew nothing about the patient whatsoever, merely that a nurse came in and gave the patient a hypodermic injection. I proceeded as best I could under the orderly's directions, and in view of the repeated urgent calls for the patient

\* Communicated informally after the banquet on April eighth.

from the amphitheatre it seemed to me an interminable time for the old man, who kept gagging, to go to sleep. We finally wheeled him in. I can vividly recall, even now, just how he looked and the feel of his bedraggled whiskers. The operation was started and at this juncture there was a sudden great gush of fluid from the patient's mouth, most of which was inhaled, and he died. I stood aside, burning with chagrin and remorse. No one paid the slightest attention to me, although I supposed that I had killed the patient. I slunk out of the hospital, walked the streets of North Boston the rest of the afternoon, and in the evening went to the surgeon's house to ask if there was any possible way I could atone for the calamity to the man's family before I left the medical school and went into some other business. To my perfect amazement I was told it was nothing at all, that I had nothing to do with the man's death, that he had a strangulated hernia and had been vomiting all night anyway, and that sort of thing happened frequently and I had better forget about it and go on with the medical school. I went on with the medical school but I have never forgotten about it." (1) Thus, in the very hospital where the first public demonstration of the value of ether anesthesia had been held nearly fifty years before, there was implanted in this Harvard Medical School student's mind an idea that something might be done to replace an unscientific and careless method of evoking ether anesthesia.

Within a year the student had become a "House Pupil" at the Massachusetts General Hospital, May 31, 1895, and as such, a beginner or "pup," as his position was known on the surgical service, it fell to Cushing's lot to etherize for

the surgeons of his time. His method of going about his new task was characteristic of the man. With him in the hospital, one year his senior, was Ernest A. Codman, who, as junior intern, had been giving anesthesia. For some months before Cushing came to the hospital, Codman had kept charts recording the pulse and respirations of the patients during operation and had added a few remarks regarding how well or badly the ether was taken, how much mucus was formed, and whether the patient vomited after returning to his bed in the ward. There was, of course, no means of recording the blood-pressure at that time.\* Cushing began making similar observations

\* Cushing's part in recording blood-pressure at operation is well-known. Bringing the Riva-Rocci instrument from Italy to this country in 1901, he reported his observations in Boston, January 19, 1903 (*Boston Med. & Surg. Jour.* 148: 250-256 (Mar. 5, 1903)). In 1920 he wrote: "This was the beginning, I think, of the general use of a blood pressure apparatus in hospital wards, whether medical or surgical, for though the principle was not new the old Gärtner tonometer was most unsatisfactory because in cases of low blood pressure, the most important ones, it was utterly unreliable. I mention this because it is not uninteresting, in view of the universal adoption, subsequently, of instruments to measure blood pressure, to recall that the Division of Surgery [Harvard Medical School] appointed a committee to report on the subject. This report appeared March, 1904, Bulletin No. 2 of the Division of Surgery, and the final conclusion of this committee was as printed: 'The adoption of blood pressure operations in surgical patients does not at present appear to be necessary as a routine measure.' I find that I have written on my reprint the verse from Dr. Holmes' Stethoscope Song:

'Now such as hate new fangled toys  
Began to look extremely glum;  
They said that rattles were made for boys  
And vowed that his buzzing was all a hum.'

I have always felt that this was one of the most interesting illustrations on record, of the reaction against the introduction of an instrument of precision into clinical use. It is precisely what happened in the case of the thermometer, the stethoscope, the X-ray, indeed of the watch itself, if one may regard

and recording them in a slightly different manner (Fig. 6). He added more notes and frequently made detailed comments on the etherization. His first chart, at least of those preserved, is dated April 5, 1895 and is a simple record of etherization of a patient suffering from osteomyelitis, operated on by John Homans, 2d, a graduate of the hospital in 1882. Cushing wrote on the chart: "Easy Case."

Of more interest to us, however, is the record of a patient with a compound fracture of the skull, operated upon on April 24, 1895 by William M. Conant. Cushing made the following abbreviated notations on the back of this record: "Patient had fearful hemorrhage from brain sinuses. Pulse kept along very well and finally went out all at once and could not be felt at wrist. With pressure which checked the hem. the pulse finally came back a few beats at a time as an engine starts up from a way-station and finally became pretty regular. 120-110-100." On the front of the record is another jotting, "Bled enormously," and finally a follow-up note, "Waverley and disch. O.K.," indicating that Cushing had followed the patient to the convalescent home in Waverley, near Boston, and had found out that the man was ultimately discharged as 'well.' In this one case is found much of the groundwork on which Cushing later built his career as a neurological surgeon. One notes the scientific attitude, the carefully kept record with its illuminating comments, the interest

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Floyer's first use of the pendulum for this purpose as a watch." The routine recording of blood-pressure, however, even at the Massachusetts General Hospital, was not rapidly adopted. Giddings (2) used the Tycos sphygmomanometer about 1915 on Farrar Cobb's cases and, although he read his paper at the hospital and emphasized the value of blood-pressure readings, the procedure was not routinely used until some years later. Possibly this was because Giddings recorded only the systolic pressure.



already evident in neurological surgery and the following of the patient to obtain the end-result. The problems of intracranial hemorrhage and anesthesia, moreover, already fixed in his mind, were to occupy him for many years after this incident of 1895, for neurological surgery could not be advanced before these fundamentals had received adequate attention. One need not go into the details of Cushing's contributions to hemostasis and anesthesia. It is safe to say, however, that the observations recorded here were the starting points for a series of innovations which were to revolutionize his chosen field of endeavor.

Another chart, July 16, 1895, records an operation upon a patient with a cerebral tumor, the surgeon being John W. Elliot. Elliot, one of the most brilliant men of his time, had graduated from the hospital in 1878. It was Elliot who, in 1887, introduced into the Massachusetts General Hospital the first gauze sponges, although carbolyzed gauze dressings had been used for many years. Cushing made many notes on this record, both in regard to the effect of the anesthesia by chloroform and the type of operation which Elliot used. The record is unique, perhaps the first brain tumor operation seen by the young physician. On the back is recorded: "Elliot said never had less bleeding in opening skull." Cushing boldly wrote across the face of the chart which he had so carefully kept: "Best case ever had."

When we turn to the house-record of this case (3), we see clearly why Cushing wrote so emphatically on the front of the anesthesia chart. The patient, Jordan Hunter, aged 32, entered the hospital July 9, 1895, complaining of headache and sensory symptoms of the right forefinger and



thumb. At operation, a "trephine opening three-fourths the size of a silver dollar, with centre about over the fissure of Rolando," was made. The dura was opened and the brain, pulsating, "looked yellowish and somewhat unnatural." No attempt was made to remove the new-growth. The patient died eleven days after the operation and Cushing did the autopsy himself, July 28, 1895, his fully recorded findings being part of the hospital record. The tumor was a teratoma of the testicle with metastases in the brain and other organs. One tumor lay in the left hemisphere, "about a half-inch under the surface of the motor area." Cushing's enthusiasm must have been high for this was the second brain tumor case coming to autopsy within a week. The first is also worthy of record.

John Maloney (4), aged 31, entered the hospital June 27, 1895, with a tumor of the vertex of the skull, "tender on deep pressure, somewhat spongy in consistence, and with an enormous blood-supply." He had been struck on the head three years before and headache had persisted from that time on. A year before entrance a small lump was noticed in the median line of the skull. Operation, July 2, 1895, by John W. Elliot, disclosed the purple tumor and thickened, freely bleeding bone. Removal was not attempted, but on July 22 a "large area of bone was removed by the chisel, hammer and bone forceps, until the tumor was exposed." The tumor was "shelled out with the fingers, leaving pieces here and there adherent." The patient died a few hours later. Cushing noted this case on the anesthesia chart as, "Cerebral tumor No. II" and wrote: "Have spec. of skull cap. Sarcoma of Brain." The tumor involved the superior longitudinal sinus and proved

Mass. Fig 13 (cont.)



The femur is mostly done  
 external to the knee  
 highly fusaride and  
 is prominently curved  
 by the femoral artery  
 which it lies upon  
 upon top of it.  
 The covering skin is  
 tense - shiny and the  
 superficial veins. Muscles  
 dilated and firmment  
 like the "Caput Medusae".

There is a loud bruit audible in  
 the mass synchronous to the pulse -  
 There is evidently a fracture (partial?) of the  
 femur as it traverses the tumor. It hangs  
 motion of the lower fragment does not give  
 much pain -  
 The lower leg is slightly swollen but not markedly  
 so. Dimension at diagonal -

Pl. Prognosis of Fracture of femur. Given a day to  
 May 1901. The patient is at night. The patient is  
 found and an air fracture -  
 seen by Dr. Robinson. Case Fractured femur -  
 Photographed -

Fig 10

March 18. Immobile. to use of remove the tumor. The

FIG. 8. Cushing illustrates a swelling of the left thigh in one of his case-records at the Massachusetts General Hospital.

to be, when examined by Edward W. Taylor and E. H. Nichols, "an endothelioma, with origin from the membranes."\* The history of both cases was reported by E. W. Taylor in October, 1895 (5), due credit being given Cushing for his autopsy report of the first case.

In these anesthesia charts and in the autopsy reports Cushing's handwriting is unmistakable, having changed little in the last forty-four years. Orderliness and conciseness are at all times evident. Those qualities, clear and succinct, were deeply ingrained in the young Cushing. To what end they were used is now a part of medical history.

It is not only from these simple charts of pulse and respirations recorded during operations, however, that we, in later years, can visualize the young, energetic house surgeon of 1895. Cushing's house-records are admirably written. Not infrequently they were illustrated by exquisite sketches, showing the site of the lesion and often the place of incision if operation took place. These drawings stand out vividly, clear testimony of the author's artistic ability as well as his accuracy of delineation (Figs. 7 and 8). It is interesting to note, moreover, that photography of patients, so frequently used by Cushing in later years, formed part of his records, although due to the poor quality of the photographic paper, Cushing's drawings have outlasted the camera record of 1895. Finally, tucked into

\* A parasagittal meningioma, also with a history of trauma, was removed years later by Cushing in the "Case of Leonard Wood" (*Meningiomas*, 1938, p. 409). The case histories, except for the time factor, are not dissimilar. Taylor remarked, in 1896, that, "if trauma is ever to be regarded as an exciting cause of tumor formation, this is a case in which it may well be conceived as acting." (5) Cushing did not forget John Maloney for in 1938 Maloney's picture and a brief account of his illness were incorporated in Cushing's monograph, *Meningiomas*, pp. 467-468.



FIG. 9. Cushing sitting in the midst of his brother house officers at the Massachusetts General Hospital, taken in 1895 or 1896. *Above:* Dr. F. S. Newell, Dr. C. N. Barney, and Dr. J. C. Hubbard; *below:* Dr. Cushing, Dr. R. F. O'Neil, and Dr. R. G. Loring.



many of Cushing's Massachusetts General Hospital records are follow-up postcards, self-addressed, for he had already begun his remarkable system, so perfectly exemplified in his latest monograph on meningiomas (1938).

Of the man himself and his subsequent career, nothing need be added here. His appearance as a young physician is well shown in the group photograph (Fig. 9), taken in 1895 or 1896, where he sits in the midst of his brother house officers at the Massachusetts General Hospital, his hand in a characteristic position and his whole attitude one of alertness. The anesthesia charts and house-records reveal, however, even better than the photograph, Cushing in 1895 and stamp him with signs of genius long before his fame became world-wide.

#### References

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- (2) Giddings, H. G. Blood-pressure as a guide during major operations. *Interstate Med. Jour.* 24: 17-25, 1917; *idem.* *Amer. Jour. Surg.* 33: (supp.) 12-18, 1919.
- (3) Massachusetts General Hospital records. *South Surgical*, vol. VI, p. 228.
- (4) *Ibid.*, p. 203.
- (5) Taylor, E. W. Two cases of tumor of the brain, with autopsy. *Boston Med. & Surg. Jour.* 134: 57-60 (Jan. 16) 1896.



