

The Massachusetts General Hospital

The sequel

NICHOLAS T. ZERVAS, M.D.

Department of Neurosurgery, Massachusetts General Hospital, Boston, Massachusetts

SINCE the 1930's, the residents and fellows of the Neurosurgical Service at the Massachusetts General Hospital have left their mark on neurosurgical practice. With work done here or at other universities in this country and abroad, they have been involved in such unique innovations as prefrontal lobotomy,⁶ diphenylhydantoin therapy for seizure,¹⁵ boron neutron-capture therapy for neoplasms,²⁰ the first positron camera,⁵ hypothermia for the surgery of cerebrovascular lesions,¹¹ studies of the cerebrospinal fluid circulation,³ the hippocampus and memory,¹⁷ use of urea for osmotic diuresis,⁹ polymer coating of intracranial aneurysms,¹⁹ the birth of microneurosurgery,⁸ the first extracranial-intracranial bypass,²³ use of the proton beam for radiosurgery,¹⁰ recognition of normal-pressure hydrocephalus,⁷ embolization of arteriovenous malformations and balloon occlusion of intracranial vessels,¹² the introduction of stereotactic anterior cingulotomy for the treatment of intractable psychiatric illness,⁴ stereotactic recording from the cerebellum of humans,²⁵ selective thermal coagulation of the trigeminal ganglion for tic douloureux,²¹ radiotelemetry for measuring intracranial pressure,²⁴ and the identification of pituitary tumors secreting only subunits of active hormones.¹⁶

In 1941, the leadership of the Neurosurgical Service was passed to James C. White, who had studied surgery of the autonomic nervous system in Strasbourg with René Leriche. He continued his lifelong interest in sympathetic surgery and the management of pain and, together with William Sweet who followed him as Chief of the Service from 1961 to 1977, published the significant monograph *Pain and the Neurosurgeon*²² in 1969.

In the past two decades, the Neurosurgical Service has been fortunate in receiving several major gifts for the establishment of research. The Pappas Foundation

funded a Professorship in Neuroscience at the Harvard Medical School and a Neuroscience Center at the Hospital, and the Mixer family donated the Mixer Laboratories which continue as active sites for research. With these gifts, a major basic and applied science effort took root. Nine basic science professors with appointments in the Department of Neuroscience at Harvard Medical School now work directly for the Neurosurgical Service supervising the work of 22 research, predoctoral, and postdoctoral fellows. Over the years, these researchers have made a number of significant contributions to science, including identification of the "no-reflow" phenomenon,² the role of neurotransmitters in vascular disease,²⁶ the structure of brain arteries,²⁷ neural protection from ischemia,¹ and the gene locations for neurofibromatosis II,¹³ von Hippel-Lindau disease,¹⁸ and human glial tumors.¹⁴

Today, the Neurosurgical Service has eight full-time surgeons and 12 residents. It commands 7% of the hospital beds and performs 1600 operations each year. The 6-year training program encompasses clinical residency, research training, and enhanced fellowship. In 1977, a subspecialty-oriented practice arrangement was initiated that now involves a number of interdepartmental alliances, the most important of which are the Brain Aneurysm Center, the Skull Base Center, the Neuroendocrine Center, the Spine Center, the Cyclotron Radiosurgical Center, the Epilepsy Service, and the Regional Tumor Collaborative. In addition, the Service directs a Comprehensive Stroke Center and a National Research Training Award, both supported by the National Institutes of Health.

The Neurosurgical Service has grown steadily as a unit committed to the academic precepts first set forth by Drs. Mixer, White, and Sweet. Their influence and the success of their vision can be seen in the large

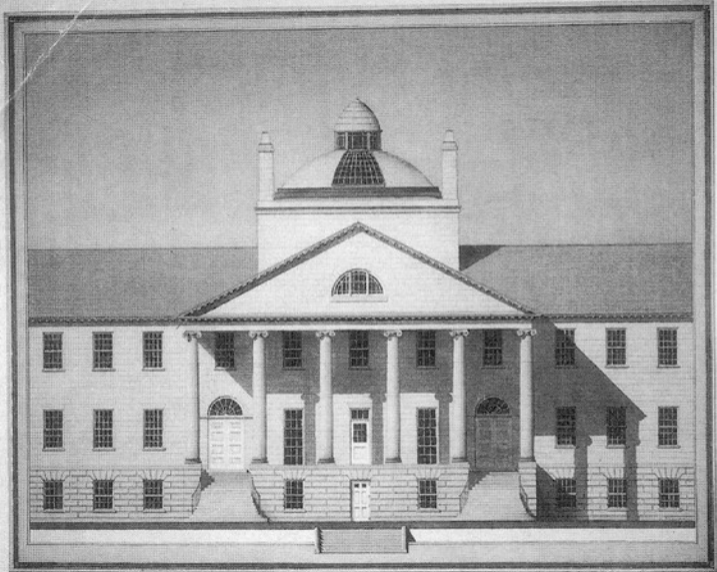
number of graduates who are now in academic practices or are department heads. Currently, for example, more than 50% of the resident graduates obtain academic appointments and 45 are or were chairpersons at other institutions — 23 in this country and 22 abroad.

The goals and accomplishments of the Neurosurgical Service are not unlike those of other major university departments. However, the great challenge as the next century approaches is to maintain the pace of change that has propelled neurosurgery in the past two decades.

References

1. Ames A III: Energy requirements of CNS cells as related to their function and to their vulnerability to ischemia: a commentary based on studies on retina. *Can J Physiol Pharmacol* 70:S158-S164, 1992
2. Ames A III, Wright RL, Kowada M, et al: Cerebral ischemia. II. The no-reflow phenomenon. *Am J Pathol* 52:437-453, 1968
3. Bakay L: *The Blood-Barrier, With Special Regard to the Use of Radioactive Isotopes*. Springfield, Ill: Charles C Thomas, 1956
4. Ballantine HT Jr, Levy BS, Dagi TF, et al: Cingulotomy for psychiatric illness: report of 13 years' experience, in Sweet WH, Obrador S, Martin-Rodriguez JG (eds): *Neurosurgical Treatment in Psychiatry, Pain, and Epilepsy*. Baltimore: University Park Press, 1977, pp 333-353
5. Brownell GL, Sweet WH: Localization of brain tumors with positron emitters. *Nucleonics* 11:40-45, 1953
6. Freeman W, Watts JW: Prefrontal lobotomy in the treatment of mental disorders. *South Med J* 30:23-31, 1937
7. Hakim S: Some observations on CSF pressure. Hydrocephalic syndrome in adults with "normal" CSF pressure. (Recognition of a new syndrome.) Thesis 957, Javeriana University School of Medicine, Bogotá, Colombia, 1964
8. Jacobson JH II, Wallman LJ, Schumacher GA, et al: Microsurgery as an aid to middle cerebral artery endarterectomy. *J Neurosurg* 19:108-115, 1962
9. Javid M: Urea — new use of an old agent. Reduction of intracranial and intraocular pressure. *Surg Clin North Am* 38:907-928, 1958
10. Kjellberg RN, Koehler AM, Preston WM, et al: Stereotaxic instrument for use with the Bragg peak of a proton beam. *Confin Neurol* 22:183-189, 1962
11. Loughheed WM, Sweet WH, White JC, et al: The use of hypothermia in surgical treatment of cerebral vascular lesions. A preliminary report. *J Neurosurg* 12:240-255, 1955
12. Luessenhop AJ, Velasquez AC: Observations on the tolerance of the intracranial arteries to catheterization. *J Neurosurg* 21:85-91, 1964
13. Martuza RL, Eldridge R: Neurofibromatosis 2 (bilateral acoustic neurofibromatosis). *N Engl J Med* 318:684-688, 1988
14. Martuza RL, Seizinger BR, Jacoby LB, et al: The molecular biology of human glial tumors. *Trends Neurosci* 11:22-27, 1988
15. Putnam TJ, Merritt HH: Experimental determination of the anticonvulsant properties of some phenyl derivatives. *Science* 85:525-526, 1937
16. Ridgway EC, Klibanski A, Ladenson PW, et al: Pure alpha-secreting pituitary adenomas. *N Engl J Med* 304:1254-1259, 1981
17. Scoville WB, Milner B: Loss of recent memory after bilateral hippocampal lesions. *J Neurol Neurosurg Psychiatry* 20:11-21, 1957
18. Seizinger BR, Rouleau GA, Ozelius LJ, et al: Von Hippel-Lindau disease maps to the region on chromosome 3 associated with renal cell carcinoma. *Nature* 332:268-269, 1988
19. Selverstone B: Treatment of intracranial aneurysms with adherent plastics. *N Engl J Med* 265:100, 1961
20. Sweet WH, Javid M: The possible use of neutron-capturing isotopes such as boron¹⁰ in the treatment of neoplasms. I. Intracranial tumors. *J Neurosurg* 9:200-209, 1952
21. Sweet WH, Wepsic JG: Controlled thermocoagulation of trigeminal ganglion and rootlets for differential destruction of pain fibers. Part 1: trigeminal neuralgia. *J Neurosurg* 40:143-156, 1974
22. White JC, Sweet WH: *Pain and the Neurosurgeon. A Forty-Year Experience*. Springfield, Ill: Charles C Thomas, 1969
23. Zervas NT: *Contributions of Residents, Fellows and Attending Staff in Neurosurgery at the Massachusetts General Hospital 1909-1983*. Boston: Massachusetts General Hospital, 1984, pp 27-69
24. Zervas NT, Cosman ER, Cosman BJ: A pressure-balanced radio-telemetry system for the measurement of intracranial pressure. A preliminary design report. *J Neurosurg* 47:899-911, 1977
25. Zervas NT, Horner FG, Gordy PD: Cerebellar dentatectomy in primates and humans. *Trans Am Neurol Assoc* 92:27-30, 1967
26. Zervas NT, Lavyne MH, Negoro M: Neurotransmitters and the normal and ischemic cerebral circulation. *N Engl J Med* 293:812-816, 1975
27. Zervas NT, Liszczak TM, Mayberg MR, et al: Cerebrospinal fluid may nourish cerebral vessels through pathways in the adventitia that may be analogous to systemic vasa vasorum. *J Neurosurg* 56:475-481, 1982

Manuscript received June 24, 1993.
 Address reprint requests to: Nicholas T. Zervas, M.D., Department of Neurosurgery, Massachusetts General Hospital, Boston, Massachusetts 02114.



2/1/00

John V. Stone 1900

