

make his breakthroughs, just as it allowed the creation of and ability to successfully use the artificial heart as well as a thousand other new capabilities in medicine.

Mark Shelton captures this spirit very well, in describing both the day-to-day operations of the neurosurgery department and the broader implications of its work.

Dr. Jannetta's weekly schedule includes many components. On the days that he operates, he usually operates on several patients at once. As a specialist, he can leave the initial cutting to his residents and concentrate only on seeking out the blood vessel which is pressing on the patient's trigeminal nerve or in the case of hemifacial spasm, on the eighth nerve. These operations are extremely delicate due to the danger of damage to the auditory nerve in particular, and one of the dangers of operating at the brain stem is loss of hearing. At Pitt, there is a special team dedicated to monitoring the patient's hearing via an electrode attached to the auditory nerve, with short bursts of sound delivered to the nerve at short intervals to note any changes in the patient's hearing. It is this team's responsibility to warn the surgeon if the monitor indicates that he is moving the auditory nerve too much.

Jannetta also attends in-house conferences on cases of patients who have died of brain disorders for which there currently are no cures, and he attends the weekly seminars at which residents present detailed papers on areas of work related to neurosurgery. As well, there is a time reserved for discussion of cases where something went wrong, either during the operation or during the recovery period.

One of Dr. Jannetta's roles as chief surgeon is to emphasize to the residents that they can't assume that they can cure every disorder that they see, that is, that they are not God. Along with that, Jannetta emphasizes the need for research in new directions and tries to ask his students the questions which will encourage them to seek solutions for longstanding problems in the field.

This is a unique look at one of the most difficult of the medical fields and how it has developed over the past century.

The United States is now facing a very broad economic crisis. Although the medical profession may not understand the full implications of that, without steel plants—formerly the basis of Pittsburgh's economy—and auto plants and an export trade based on scientific and technological progress, there is no economic base to support the remarkable work being accomplished at places like Presbyterian and many other medical institutions around the country.

Yet, that is no excuse to replace advanced surgical techniques with acupuncture or other "alternative medicines"; and it is certainly no reason to buy what Hillary Clinton, in what seems to be her ignorance, is trying to sell, i.e., a health plan based on potentially "downsizing" the types of programs for which Jannetta is responsible and possibly decreasing the numbers of patients who would have access to such care.

## On the frontier of vascular neurosurgery

by Janice Chaitkin and Gabriele Chaitkin

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### **The Healing Blade: A Tale of Neurosurgery**

by Edward J. Sylvester  
Simon & Schuster, New York, 1993  
240 pages, hardbound, \$22

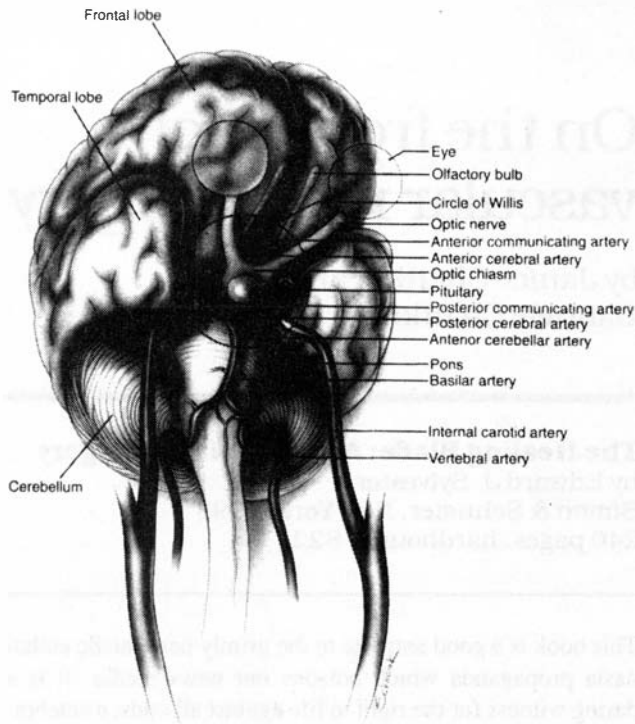
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This book is a good antidote to the grimly pessimistic euthanasia propaganda which poisons our news media. It is a daring witness for the right to life against all odds; a celebration of the power of the human mind. Edward Sylvester, a professor of journalism at Arizona State University, draws the layman into the subject of neurosurgery—especially vascular neurosurgery—by focusing on Barrow Neurological Institute (BNI) and its director, Dr. Robert Spetzler, one of the world's leading vascular neurosurgeons. Sylvester spent countless hours at BNI in Arizona, following several cases over three years.

Especially noteworthy features of the book are its lucid descriptions of complex medical procedures and of the structures and functioning of the brain. Very helpful for the layman is the depiction of the brain and its main arteries on p. 20, shown here.

Very simple and effective, for example, is Sylvester's description of the "circle of Willis," a major thoroughfare for the blood to the brain: He asks the reader to hold up his arms, press them together and hold the fingers up forming the palms into a circle. There you have your "circle of Willis," the only circular flowing stream of blood in the body, and the main infrastructure for blood supply to the brain. The fact that it is circular is important, he says later, because if one of the delivering arteries is shut off, the other side can provide blood for all of the brain. In this way, he is able to show the high adaptability of the brain, and how nature has come up with some astonishing solutions to potential problems.

While detailing some of Dr. Spetzler's most challenging cases, Sylvester relates the history of neurosurgery and its pioneers. He also introduces us to modern technologies, such as the intraoperative microscope, which was only introduced in the 1960s, the special clips to close off aneurysms, and the three-dimensional monitoring field, especially helpful for the



*Artist's depiction of the brain and its vascular system.*

observing resident physicians. This book helps the reader better understand the brain and some aspects of our own cognitive capacities.

The book begins with a description of one of the most rarely performed medical procedures, a hypothermic arrest, used in this case to clip a ruptured cerebral aneurysm (an aneurysm is a ballooning of the wall of a weakened artery). Sometimes called a "standstill," the procedure makes it possible for the skilled surgeon to operate deep within the brain. The operation proceeds "in normal fashion" until the surgeon requires an operating field free of blood. At that point, the anesthesiology team and the cardiovascular surgeons begin slowly cooling down the body of the patient by pumping his blood through a refrigerating machine outside the body. Simultaneously, sophisticated barbiturates, which have been constantly refined over recent years, lower the patient's brain wave activity.

When the body temperature is just under 61°F and the brain temperature is about 63°F, the blood is drained out of the body, the heart is stopped, and the brain activity slowed to a "standstill." The neurosurgeon, now able to operate in a blood-free field, clips the aneurysm. The neurosurgeon has less than one hour to perform this operation before re-warming has to start. In the case Sylvester presents, the clipping of the aneurysm took only 18 minutes. Now the difficult

process of bringing the patient "back to life" begins.

Sylvester's book instills in the reader an awe for the amount of work and technology which is necessary to save one human life, causing an appreciation of the years of work and thought—and yes, love—put into every little detail of neurosurgery.

### **Early calling to neurosurgery**

Dr. Robert Spetzler is one of the world's most skilled vascular neurosurgeons. Born in Germany, he and his family emigrated to the United States after World War II. Following the failed July 20, 1944 bomb plot to kill Hitler, Spetzler's father and uncle were accused of building the timing device for the bomb, and his uncle was shot by Hitler's henchmen. As a young child in postwar Germany, Robert Spetzler contracted tetanus, and was able to survive only because he was one of the first to receive penicillin from the Allied troops.

While still a high school student in suburban Illinois, Spetzler had already decided to become a brain surgeon. He chose to study at Northwestern with Paul Bucy, because Bucy had been a student of Harvey Cushing, the legendary founder of the discipline of brain surgery. He subsequently studied with two other of the great names in the field: Gazi Yasargil, most famous for inventing the clip for aneurysms; and the demanding Charles Wilson, who set up one of the nation's top neurosurgery training programs at the University of California at San Francisco. Spetzler is also a gifted pianist and keeps a piano in his office at BNI. While he operates, he listens to Mozart.

According to Sylvester, Spetzler is striving to educate a new generation of neurosurgeons, who will go beyond his own high level of achievement.

Spetzler has a very inquisitive mind. He is described by colleagues as an individual who can concentrate on something absolutely and exclusively. Many neurosurgeons will operate from a particular angle, whereas Dr. Spetzler has the rare capacity to operate from all angles, giving him great flexibility and the ability to reach otherwise inoperable problem areas. In the book, Dr. Spetzler describes the painstaking preparations he makes to ensure that there are no surprises during an operation. Modern breakthroughs in diagnostics and the constant refinement of various scans give the surgeon his "roadmap," since each person's brain and vascular system are a little bit different. The night before surgery, Spetzler reveals, his nightmare is that there will be a surprise, something unforeseen.

He and his associates also learn from mistakes, sometimes deadly ones: "There is nothing worse than losing a patient," he says. "It leaves me devastated for days. I am sometimes brought to tears. There is nothing to be done about it. Because you have to take it personally. I always tell the residents that: I don't want to see you toughing it out. I don't want to see you getting it out of your system too quickly. It is a terribly personal thing. Take it personally."

## The life-saving laboratory

Failures in the operating room are reevaluated in his laboratory, where the tools and techniques of his art are invented. The failures make starkly clear the importances of laboratory and animal studies to medical research and the horrible absurdity of the so-called animal rights advocates.

Sylvester's book also stresses the importance of the technological advances in the tools of surgery. Though Spetzler acknowledges his special gift for vascular surgery, he wants to ensure that all vascular surgeons can have the physical capability to do what he can. Toward this end he is deeply involved in designing new instruments and robotic devices: For example, he has developed an instrument which helps to place an aneurysm clip correctly, thereby, he says, making "any neurosurgeon a very good neurosurgeon."

## Listening to the fugue

However, Spetzler's main ambition is to make his profession obsolete: finding cures, being able to replace damaged brain tissue, to "repair" the brain, or prevent problems from arising. " 'Neurosurgeons will play a critical role in bringing all this about,' Spetzler says, and in doing so may put themselves out of business. But, 'It is not an unglorious occupation to put yourself out of business. That requires all of the very best talents. The sin is to try to hang on to the past only to have a profession, rather than using discoveries to make a glorious step into the future, to be part of whatever comes next.' "

Spetzler became director of Barrow Neurological Institute in Arizona in 1986 and developed it into one of the most modern centers for neurosurgery in the world. He emphasizes teamwork in all the disciplines necessary for his field, and

teamwork, he is convinced, is the secret of the many successful "standstill" procedures he has performed there. Another factor is certainly the great amount of excellent research done at Barrow.

Spetzler also rejects the argument that there is any procedure too expensive to perform. This book beautifully proves that surgery "on the frontiers" will repay the cost many times over, eventually becoming a standard procedure, thus pushing the boundaries of life back, one step at a time.

Sylvester insightfully compares the interplay of questions posed and answered in neurosurgery to a fugue in Classical music: "Finally there is the fugue, the most complex of the three [musical forms including the round and the canon], that follow this same idea of introducing higher-level repeats that are not quite repeats. The fugue, too, goes on and on, with a newly entering musical voice overlaying a theme so similar to the preceding that it catches your ear, your mind's ear. And endless in repetition it is, and not quite a repetition, now faster, now slower, and sometimes working in upon itself." Sylvester might have added that while listening to a fugue, you do not hear the composer's whole intent in any one voice or even in the successive voices. You suddenly hear a voice which seems to unify all the different voices and ideas into an altogether new idea: one which is not to be found anywhere in the notes, or, for that matter, in the three pounds of tissue in your skull.

## Books Received

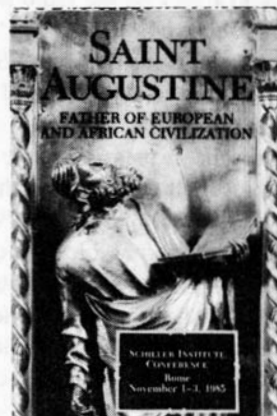
**The Downing Street Years**, by Margaret Thatcher, HarperCollins, New York, 1993, 914 pages, hardbound, \$30

**The Struggle for Russia: Power and Change in the Democratic Revolution**, by Ruslan Khasbulatov, edited by Richard Sakwa, Routledge, New York, 1993, 270 pages, hardbound, \$29.95

**Tower of Secrets, A Real Life Spy Thriller**, by Victor Sheymov, Naval Institute Press, Annapolis, Md., 1993, 230 pages, hardbound, \$24.05

**Dorothy Maynor and the Harlem School of the Arts: The Diva and the Dream**, by William F. Rogers, Edwin Mellen Press, Lewiston, N.Y., 1993, 286 pages, hardbound, \$79.95

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