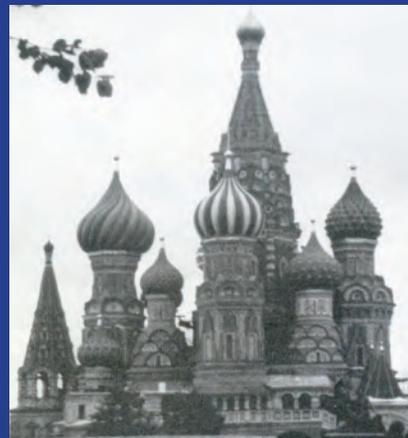




On a 1958 trip to the Soviet Union, Mark Ravitch learned that Russia had made strides in refining a turn-of-the-century invention he'd been curious about since he was a resident: the surgical stapler. In the following decades, Ravitch worked with United States Surgical Corporation (gratis) to bring this technology to America and train surgeons from around the world to use the devices. ABOVE: Ravitch (center) with colleague Pavel Iosifovich Androsov and their guide, "Tsintsiper." RIGHT: A snapshot of St. Basil's Cathedral taken by Ravitch on his trip.



MARK RAVITCH BOTH MADE AND WROTE
SURGICAL HISTORY | BY ELAINE VITONE

THE SURGICAL CURMUDGEON

Each week, the late Mark Ravitch would sit and smoke his pipe in the front row of the surgical conference room in Presbyterian University Hospital, his pale blue eyes and large, gray eyebrows fixed in a stern expression. At the Department of Surgery's weekly morbidity and mortality conferences he led in Pittsburgh throughout the 1970s and '80s, residents held their collective breath as he read the list of all the operations they had performed that week.

If things had not gone well in any of those cases, there was no question that Ravitch would know and call a hapless resident out on it.

And then there you were, answering to *the* Mark Ravitch, surgeon-in-chief of Montefiore Hospital. The one who had introduced America to the surgical stapler—a device that was in those years just beginning to revolutionize surgery—and taught doctors all over the world how to use it. Who had edited nearly 20 medical journals and knew the science, practice, and entire history of surgery backward and forward. The one who had published a paper or book on almost any kind of case you could present to him, from the top of the esophagus to the bottom of the gut.



ABOVE: (From left) an unidentified Chinese colleague with Mark Ravitch, Thomas Starzl, and Henry Bahnson in Shanghai in 1983. The Pitt pack—including Charles Watson and Marshall Webster (not pictured)—visited nine Chinese cities and lectured in five medical schools on this monthlong trip.

COURTESY MARSHALL WEBSTER

No pressure.

How did you manage the patient?, Ravitch would ask, in his low, gruff voice.

Well, Dr. Ravitch, the resident would stammer, *We prepared him for surgery, then we took him to the operating theater and anaesthetized him ...*

Of course you did, he'd say. *You didn't operate on him on the floor. You didn't operate on him without anesthesia.*

He expected you to cut straight to the core problem, think clearly, and speak concisely, recalls Peter Ferson (MD '73, Res '79), professor of surgery at the University of Pittsburgh. Seconds count in the field of surgery, after all. If you wasted them, he would interrupt: *Didn't somebody have a dime to go call for help?* Or worse: *Why didn't you just take a gun and shoot him?*

If he took out his pipe and thumped it in the palm of his thick hand, you knew you were really in trouble.

Ravitch cowed his students on purpose, he admitted to colleagues. He used to say he never learned anything from anybody who was just complimenting him.

"I think he understood that we could see through it and recognize that his goal was to educate us and to clear our thoughts from cloudiness," says Ferson.

Ravitch would often pick on residents simply because of the way they had noted their operations on the list. If someone wrote, say, *Billroth Procedure*, he would ask who Billroth was (Christian Albert Theodor Billroth, the Prussian-born father of abdominal surgery and close friend of Brahms, of course) and where he went to medical school (University of Greifswald, naturally). Ravitch's knowledge—not just about surgery, but, by many accounts, most any topic—was encyclopedic, and he expected the same from his trainees. He wanted them both well read and well spoken.

The 45-year-old gentleman presented feeling nauseous, a young surgeon in training would say.

How did you know he was a gentleman? Ravitch would deadpan, glowering over his glasses. *And the patient was nauseated. You are nauseating.*

He once wrote, *Be wary of a man who cannot speak his native tongue*—a sensitivity that was probably heightened by the fact that he spoke Russian, German, and French. And a bit of Spanish and Italian. Plus Latin (recalling his high school classes). And he could pretty much wing it through most anything Slavic or

Latin you threw at him.

At first glance, the barrel-chested Ravitch was "incredibly intimidating," says Andrew Peitzman (MD '76, Res '84), a Pitt Distinguished Professor of Surgery, Mark M. Ravitch Professor, and vice chair of surgery, "but once you got to know him, he was just an incredibly good guy. . . . When I was senior chief on service, one of my kids was sick, and this big, gruff guy came to see my kid with a teddy bear in hand. It showed me what the real Dr. Ravitch was like."

For years, a group called the Ravitch Society—trainees from his 45-year teaching tenure at Johns Hopkins, Columbia University, the University of Chicago, and the University of Pittsburgh, where he arrived in 1969 and remained until his death in 1989—met annually in conjunction with the American College of Surgeons. Three generations of surgeons from all over the world would laugh over drinks, sharing stories and filling in one another's punch lines. If Ravitch wasn't presenting at some other conference that weekend (he continued teaching and lecturing until his death at age 78), he'd make an appearance, too.

The society wasn't just about merrymaking in the hotel bar though. A few months before Ravitch died of prostate and colon cancer, Hopkins named its first Mark M. Ravitch Chair of Surgery, funded by the society. Pitt endowed its chair at about the same time, too.

After his death, several Ravitch Society

Curmudgeon."

In talking to those in the halls of Pitt who knew him, and sifting through the letters, eulogy transcripts, and essays written in his honor—not to mention the tomes of his own writing—one has to wonder what Ravitch would have to say about how his memory has endured.

Well, besides the obvious: *Festschriften are not posthumous. The word they were looking for was Gedenkschrift.*

Ravitch was born in 1910 in New York City, the only child of Russian intellectuals, and grew up in the Bronx, near Crotona Park. He graduated from high school at 15. After receiving his bachelor's degree in zoology from the University of Oklahoma in 1930, he applied to Harvard Medical School but was rejected—a lucky break, as he later saw it, since it brought him to Hopkins, where he completed his MD, surgical internship, and pediatric residency, then remained to conduct research in surgery.

Ravitch trained under the renowned Alfred Blalock in the days when being a resident meant you essentially lived in the hospital. (Marriage was forbidden. Ravitch and his wife, Irene, married anyway, in secret, during his second year. They had three children: Nancy "Bunny" Ravitch Schwentker in 1941, Michael Mark Ravitch in 1943, and Mary Robin "Binnie" Ravitch in 1946.) Ravitch served three years on the European front during World War II. Once, during the Battle of the Bulge, he operated

I truly believe, wrote John Landor, that Dr. Mark Ravitch always looked upon adults simply as grown children!

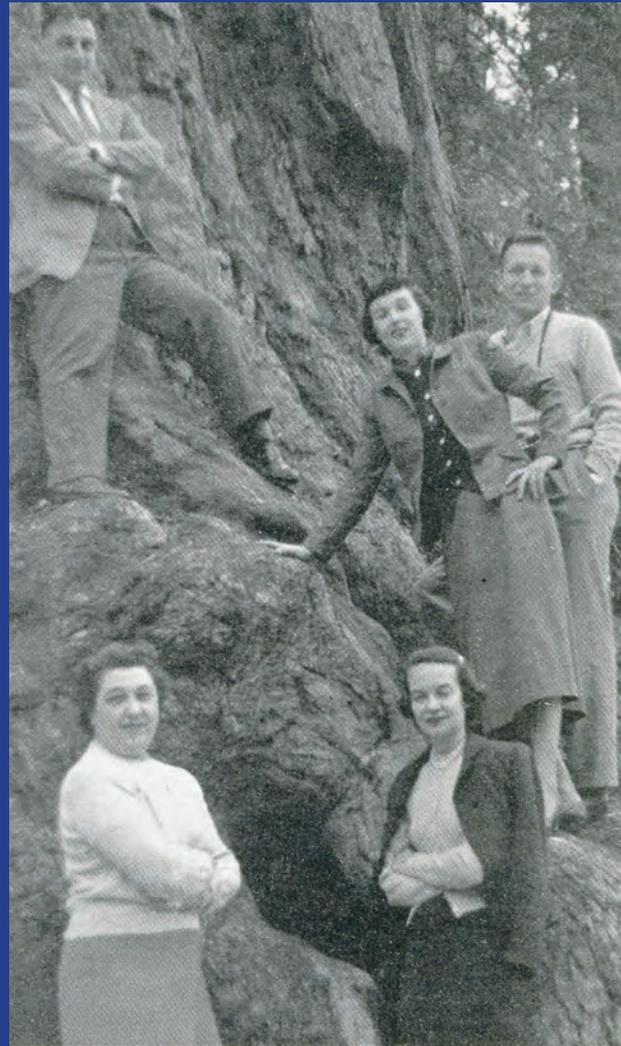
members, including the late Henry Bahnson, cardiothoracic surgeon and chair of Pitt's Department of Surgery from 1963 to 1987, were interviewed in a 30-minute video celebrating Ravitch's life and career. "I can remember distinctly," said Bahnson in the video, of his training under Ravitch at Hopkins, "Mark would come into the operating room, and I don't know if he'd do it intentionally or not, but he would stand up on a little stool, and he would stand up close, and the tips of his soles would dig into my calves."

Ravitch fans, friends, family, and surgical progeny also took part in the May 1990 "*Festschrift*" issue of *Surgical Rounds*, a journal for which Ravitch had edited and penned a column titled "Thoughts from a Surgical

for 72 hours straight. In 1946, he returned to Baltimore as the first director of Hopkins' blood bank.

Two years later, Ravitch published a paper that proved to a skeptical American surgical community once and for all that a nonoperative approach to reducing hydrostatic pressure in infants and children with intussusception saved lives. He would eventually become the first to elucidate this once-mysterious ailment with comprehensive basic and clinical science.

In 1949, he developed a technique for correcting pectus excavatum, a congenital deformity that twists the sternum inward, creating a "funnel chest." His method, which involved disconnecting the ribs to allow the sternum to reshape, was standard care for decades.



LEFT: Nikolai (Mykola) Amosov, the Lenin Prize-winning surgeon who first demonstrated surgical stapling for Ravitch, in a snapshot taken by Ravitch in 1958. MIDDLE: (Clockwise from the left) Mark Ravitch, Louise and Hank Bahnon, Peggy Hanlon, and Irene Ravitch. ABOVE: Major Mark Ravitch, who served in the Battle of the Bulge.

Throughout his career, Ravitch remained the world authority on chest-wall deformities.

In the ensuing decades, spent in New York, Baltimore, Chicago, and Pittsburgh, Ravitch would innovate procedures for a number of surgical challenges. “He was probably one of the most prominent surgeons of the 20th century,” says Marshall Webster (Res ’70), now senior vice president of UPMC after serving as executive vice president of UPMC, president of its Physician Services Division, and Mark M. Ravitch Professor of Surgery at Pitt.

After Ravitch left Hopkins, he practiced general surgery, but, as John Landor, then-professor of surgery at SUNY Health Science Center at Brooklyn, noted in his *Surgical Rounds* tribute, Ravitch’s first and most enduring love was pediatrics. *Were it not for the siren call of the intriguing possibility of applying stapling technology in general surgery . . .*, he wrote, *he might have ended his illustrious career solely recognized as a pediatric surgeon.*

At the start of Ravitch’s career, children were still treated as small adults. He advocated for establishing pediatric surgery as a distinct specialty and is still considered a founding father of it. Among his many awards and accolades was the William E. Ladd Medal of the American Academy of Pediatrics—the highest honor for contributions to the field of pediatric surgery.

I truly believe, wrote Landor, that Dr. Mark Ravitch always looked upon adults simply as grown children!

In September 1958, Ravitch and his colleague, Duke University’s Ivan Brown, walked into the thoracic surgery institute in then-Soviet Kiev. Ravitch, of course, acted as interpreter (his Russian was “badly accented and ungrammatical,” by his own estimation—he spoke “like an Armenian,” his Russian-born father teased). In the large office, behind an enormous desk, the Americans found the

surgeon-in-chief, Nikolai (Mykola) Amosov, a man of slight build, his teeth capped in stainless steel.

Ravitch probably wasn’t expecting much to come of this meeting. As representatives of the National Research Council, his group had been sent to meet with experts at the blood-transfusion institute, but it was now clear that that was out of the question. In the medical facilities that did honor the group’s requests to visit in this Iron Curtain era, everyone was quick with offers of food and vodka, but when Ravitch asked if they could visit the wards, the answer was, without fail, *Nyet*.

To Ravitch’s delight, Amosov leveled with him, speaking freely of his mortality and complication rates. Ravitch asked if his group could attend rounds. Amosov did his best to comply, but an administrator intervened. *Ward 1 is too untidy. . . . Ward 2’s visiting hours are over. . . . Nyet. Nyet. Nyet.*

Clenching his teeth, Amosov said, “Bring

Semenov, Ivanov, Salydkin here at once, with their x-rays and their charts." And, straight away, the three patients were sent shuffling into the office in their robes and slippers, their charts and x-ray folders in hand.

What these cases revealed startled Ravitch: 3- and 4-inch double lines of thin white "B"s—metal staples—in the chest x-rays. Amosov said his institute had used them in some 200 lung resections. The following day, in Amosov's operating room, Ravitch marveled at the instruments' "extraordinary simplicity and efficiency."

Ravitch tried to find a government office where he could request a stapler to take home, but none of his calls panned out. *I suppose it was not unlike what might have happened if one had been at Fort Bragg in 1939 and seen a bazooka and said, "That looked like a dandy little weapon, and how did one purchase one?"* he later wrote. Ravitch gave up and went sightseeing.

A few nights later, he and his colleague were dining in a Leningrad café when a young couple asked if they could share the Americans' table; all the others were taken. Ravitch got to chatting with the locals and mentioned the staplers, which the young man said he was familiar with. In fact, they're made at a factory just outside the city, he said.

Upon hearing this, Ravitch thought of something curious that he had seen in Nevsky Prospect: a storefront sign with rounded gold letters on a black background that read, "Surgical Instruments and Apparatus."

Ravitch had puzzled at this. A business-district store selling the tools of an industry that was entirely government run? It made no sense. But he and Brown visited the store the next day and found it was true.

The only stapler they had in stock that day was a bronchial stapler.

"Is it for sale?" he asked the clerks.

"Yes."

"Is it for sale for cash?"

"Of course."

"How much?"

"440 rubles."

"Could we buy it right now?"

"Naturally."

"We are foreigners," Ravitch said, though he knew that was plain enough.

"What of it?"

Ravitch and his companion each left the store that day the proud owner of a 33-centimeter-long, 640-gram bronchial stapler in a black-velvet-lined birchwood box.

A few days after his return to Baltimore, Ravitch presented the stapler in the auditorium during grand rounds, demonstrating on an autopsied human lung. With one stroke of the instrument, he closed the bronchus—an operation that normally would require a dozen silk stitches, each individually sewn, tied, and cut. When Ravitch finished, a distinguished thoracic surgeon in the audience spoke up: *Well, that's great, but it looks awfully big and heavy. Besides, I love to sew.*

Ravitch would hear these same complaints for the next decade. And he understood why. *Surgeons are craftsmen*, he wrote. *They are proud of their art and reluctant to believe that an automatic instrument can do things as well as they can, let alone better.*

But Ravitch was convinced. In the July 1959 issue of *Surgery*, he predicted: *There seems to be reason to believe that some of these instruments and their derivatives will find a permanent place in surgery.*

The surgical stapler was invented in Hungary in 1908 (See Last Call, p. 40). But it was the Soviets who first saw its potential to change surgery on a grander scale.

During World War II, the Soviets endeavored to advance the technology, hoping to standardize surgery and better arm surgeons with a range of experience and skill levels to cover vast swaths of territory. The Scientific Research Institute for Experimental Surgical Apparatus and Instruments in Moscow—a monster effort of some 204 engineers, designers, draftsmen, machinists, lab techs, surgeons, and microbiologists—created scores of specialized instruments. There were staplers for bone, blood vessels, and even corneal grafts.

When Ravitch returned to Baltimore, he immediately began a series of animal experiments with colleagues Felicien Steichen, a mentee whom he later recruited as a Pitt professor of surgery and an associate chief of surgery at Montefiore in the 1970s, and Peter H. Weil, then chief resident at Lincoln Hospital in New York. They feared that the pressure from the instruments' closing jaws would damage the tissue, cause the seams to bleed, and allow newly sealed organs to leak. But none of this was the case. As they operated on the bronchus, as well as the lungs, the closures were "perfectly secure," the healing "beautiful." And then, some years later, they tried a more all-purpose Soviet stapler, called the UKL, to close portions of the intestines.

We were absolutely delighted with it, he wrote.

Ravitch presented on the lecture circuit. Word about the staplers was getting around America. Newspapers covered his talks regularly. The February 1960 issue of *Popular Mechanics* ran a photo of a young beauty in a nursing cap holding a Russian stapler. The caption bragged, *It can even stitch sections of the heart.*

Several manufacturers approached Ravitch but backed out for various reasons (only to regret it later). In the end, it was United States Surgical Corporation, founded by Leon Hirsch, that finally took the plunge. Hirsch and Ravitch met through a patent broker and spent the next three years working together on a line of staplers. Once launched in 1967, these products grew company revenues from \$350,000 to more than \$1 billion in 1998, when United States Surgical was sold to Tyco International.

Ravitch, citing the inherent conflict of interest, did all of his consulting on product design free of charge.

Ravitch noted that, because each of the Russian staplers was handmade, the parts were not interchangeable. Each staple was loaded by hand into a tiny cartridge (a concern Amosov had dismissed—*Just leave it to young nurses with good eyesight*, he said). United States Surgical's staplers were manufactured to accommodate staple cartridges that were preloaded, fully interchangeable, and color-coded for various staple sizes.

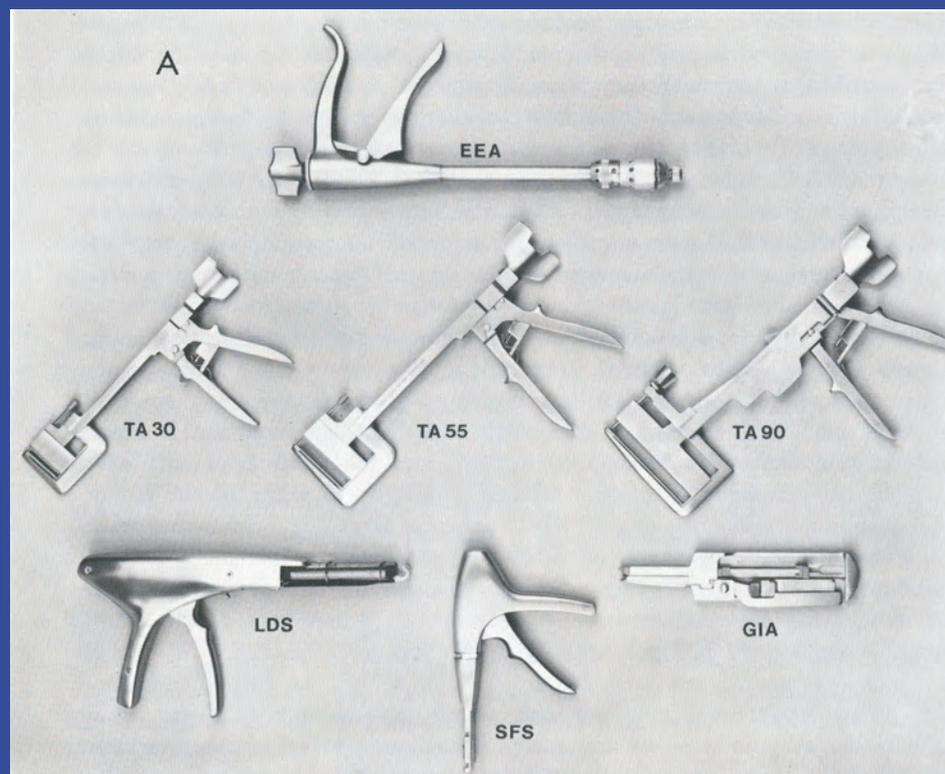
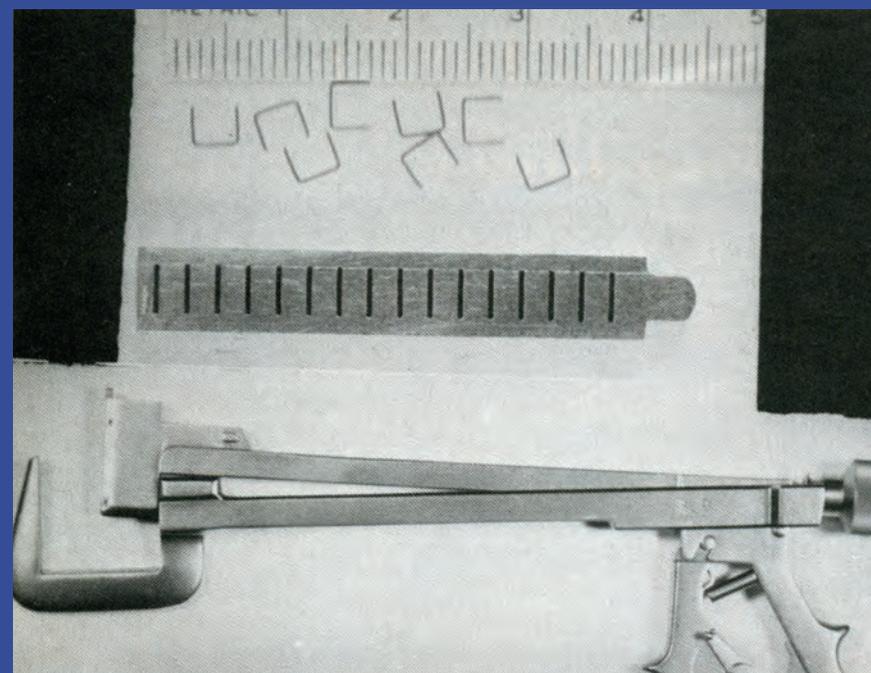
Thoracic surgeons, eager to improve the safety of air-leak-prone bronchial closures, were the first to come around. The gastrointestinal surgeons followed when they realized how much easier it made their most challenging resections—the extreme high and low ends of the gastrointestinal tract.

With today's GIA (gastrointestinal anastomosis) stapler, you load it and fire it, which seals then cuts the ends of the intestine portion you're removing, says Peitzman. "The scrub tech reloads it, which takes 30 seconds. You fire it and resect the other end. You can do an anastomosis in literally a couple of minutes. By hand, the operating time is 10 times longer."

Stapling made possible several entirely new operations. Previously, a patient undergoing rectum resection would spend the rest of her days wearing a bag—staplers make it possible to restore function.

"Almost nobody today would sew the major arteries or veins of the lungs," says Jean-Michel Loubeau (Res '77). "We use staplers to do that now."

Smaller, private hospitals were the first to use staplers. Larger centers and universities came



LEFT: The first stapling instrument Ravitch brought home from the Soviet Union, a bronchial stapler. RIGHT: The original line of American surgical staplers, each loaded with disposable, presterilized, preloaded, and interchangeable staple cartridges.

last, influenced by “pressure from below.” One of the last barriers was that surgeons quickly became so sold on the technique that they didn’t want to bother with prospective clinical trials. (Eventually, and repeatedly, studies would show that stapling and sewing are equivalent in terms of safety.)

At Pitt, Ravitch and Steichen developed a stapling course, which was attended by hundreds of surgeons from all over the world. “They were absolutely great instructors,” says Loubeau. “Both Dr. Ravitch and Dr. Steichen had the training that allowed them to do all kinds of operations.”

As it turns out, there is still plenty of skill involved in stapling. In fact, entirely new, specialized skills abound, thanks to this instrument once feared as a mechanical replacement to the surgical artist’s hand: Staplers opened the door to minimally invasive surgery—starting in the ’90s, they were miniaturized for this purpose. Now, even a liver resection can be performed laparoscopically.

In 10th century Arabia, wounds were closed by holding a large ant at the edges until it bit and then decapitating the critter. Through the ages, others used catgut, sheep intestine, and tendons of foxes, squirrels, opossums, moose, caribou, whales, reindeer, rats, rabbits, and

kangaroos.

This is a Ravitch aside if there ever was one. He loved history. When the American Surgical Association asked him to write its organizational history in the early 1980s, they figured on a 300 or 400 pager. What they got was two volumes—750 pages each. Much of his material came from his personal library. His family donated his collection, which dated back to 1496, to Falk Library a few years after he died. (You’ll find it on the second floor, in the Ravitch Room.) The Ravitches also donated to the National Library of Medicine some 200 boxes from his offices.

During Ravitch’s tenure, walking into those rooms in Montefiore (where internal medicine is now) was like walking into the Taj Mahal, says Ferson.

“Flip the lights on, and there were treasures. Pictures of every major general surgeon in the country. Artifacts from his travels around the world.”

“He saved everything and knew exactly where everything was,” says Theresa Ratti, his assistant of eight years, starting just as *A Century of Surgery* was under way. It was the most interesting job she’s ever had, she adds.

“He often said the doctor who got the eponym was never the first person to have

described it and could give you lots of examples,” says Webster.

Ravitch’s office was also a site of surgeon hazing. He used to fill the room with the smoke of cheap cigars, bought at Thrift Drug, even though he knew it bothered guests, Ratti says with a laugh.

But after the trial by smoke, to know Ravitch was, by many accounts, to find yourself in a special kind of paternal care.

“When I saw that Dr. Peitzman got the Ravitch chair, I was so glad. Dr. Ravitch always really liked Dr. Peitzman and knew he was a solid guy, a solid surgeon.”

And when she saw Peitzman in the hall, she told him so—a compliment that still awes and humbles him years later.

“[Ravitch] was the conscience of the residency program,” says Ferson.

“We’d be doing an operation, and we’d say, *Okay, what’s Dr. Ravitch gonna say about this?* ... When you’re involved in the milieu of a difficult case, it’s unclear what’s the right thing to do. But if I step back and pretend I’m in his chair, it’s a lot easier. We’ve all learned to ask those questions: What’s the core problem? What’s the fundamental issue? Is this a wise thing to do? Sure, you could do it, but is it intelligent?” ■