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Columbia's Historic Atom Smasher Is Now Destined for the Junk Heap

By WILLIAM J. BROAD DEC. 20, 2007

Columbia University has decided to junk a 70-year-old atom smasher that is the nation's oldest artifact of the nuclear era, ending weeks of internal debate and lobbying over its fate.

The machine, known as a cyclotron, sits in the basement of Pupin Hall, home of Columbia's physics department. Covered by dust and graffiti, it weighs 30 tons and stands seven feet tall and 12 feet wide, its giant arms holding aloft a huge electromagnet that once helped guide subatomic particles and split atoms.

Its breakthroughs led to the secretive race for the atom bomb in World War II and, afterward, to Pupin Hall's designation as a national historic landmark.

Starting this fall, a loose coalition of preservationists at Columbia argued that the machine represented a link to the earliest days of the nuclear era and should not simply be discarded.

"It's an extremely important cultural icon," David J. Brenner, a medical physicist at Columbia and the chairman of its radiation safety committee, said in an interview. "It represents one of Columbia's biggest contributions to world history."

But university officials questioned some claims about the machine, and said its space was needed for expansion, despite Columbia's \$7 billion plan to enlarge its campus over the next 25 years.

Late last week, they decided to cut up the cyclotron and sell its metal for scrap.

"I think the decision is the correct one," Andrew J. Millis, chairman of Columbia's physics department, wrote to the faculty, in a letter released by the university. "Our organizational energy and fund-raising efforts are best dedicated to the direct benefit of faculty and students here now and those to come, while honoring the intellectual history we have inherited."

The debate parallels a national one on



Steve Duncan

The cyclotron in 2006, built by John R. Dunning in 1939, in the physics building basement at Columbia.

what to do with equipment and factories left over from the start of the atomic age. Many objects are crumbling or being bulldozed, while federal and private officials try to save a few.

"Thousands of artifacts are at risk," said Cynthia C. Kelly, president of the Atomic Heritage Foundation, a private group in Washington. "The question is where you draw the line. So far, it's been drawn short of the mark for lack of funding."

At Columbia, money was a main issue. Officials said the cheapest alternative was to junk the atom smasher and recycle its metals. (The machine is no longer radioactive.) That might cost \$90,000.

Dismantling the machine and putting it into storage until a home could be found for its permanent display might cost twice as much. Readying it for public viewing would cost still more.

In interviews this week, preservationists expressed hope that some parts of the atom smasher might still be preserved.

"We're going to try to save pieces and

important slices," Allan S. Blaer, a professor of physics, said in an interview. "We want to use those as displays of the history that went on — to give a feel for what it was like."

A debate over what to do with historic but unwieldy artifacts.

In lobbying for the cyclotron, preservationists cited what they called its singular history. The machine split atomic nuclei in two, helping inaugurate the nuclear era.

In 1935 and 1936, during the Great Depression, John R. Dunning, a Columbia physicist, built the atom smasher out of salvaged parts, industry donations and private gifts. It used powerful magnetic fields to keep particles in spiral paths, at speeds up to 25,000 miles per second, before smashing them into targets. On Jan. 25, 1939, its detector helped confirm the splitting of uranium atoms done days earlier in Europe, recording some of the world's first inten-

tional bursts of atomic energy.

Then, in a first, in 1940, scientists at Columbia used the machine to fire subatomic particles at a very pure sample of uranium and identified its fissionable form. Uranium 235, unlike the more common variety, was found to readily split in two. "These experiments," the scientists wrote, suggest "the investigation of chain reaction possibilities."

Two years later, President [Franklin D. Roosevelt](#) ordered the production of an atom bomb, and the Manhattan Project was born. Its secret labors culminated in a July 1945 explosion that shook the New Mexican desert.

After World War II, Columbia scientists used the atom smasher for physics experiments until its retirement in 1965. Administrators then sent a relatively small but central part of it — the metal casing that held whirling particles, as well as some ancillary equipment — to the [Smithsonian Institution](#) in Washington.

This fall, a Columbia newsletter carried news of the machine's impending demise. "Cyclotron Passing Into History," read the headline. The report helped inspire the alliance of preservationists and the debate at Columbia over the machine's value. One point of contention was whether the hulk in the basement represents the machine's essence or just an insignificant remnant. The preservationists wanted the university to erect a permanent display on campus that would tell the story of the cyclotron and Columbia's role in the nuclear age. But the administration held that the heavy machine required a basement with a thick concrete foundation and that the school had no appropriate site.

Dr. Millis, the physics chairman, acknowledged in an interview that the cyclotron had played an important role in early atomic history but added that any commemorative value had to be weighed against the need for expansion.

"Everybody is sensitive to its historical value," he said. "But the question is what you actually do with many tons of metal."

Columbia approached the Smithsonian about taking the rest of the machine, but the institution felt the cost was high and the chance of display low. Roger Sherman, the Smithsonian's cu-

lator of modern physics, learned of the university's decision from a reporter.

"In general," he said, "it's regrettable any time something important and historic disappears."

Spencer R. Weart, director of the Center for History of Physics at the American Institute of Physics, a private group in College Park, Md., said the only cyclotron that rivaled Columbia's in importance was at the University of California, Berkeley. There, he said, the school put one of the great magnets outdoors on permanent display.

"Has anybody thought of doing something like that in New York?" Dr. Weart asked. "It would make an impressive sculpture and catch the spirit of the early days when big science was just starting up."

The hard choices surrounding the cyclotron resemble those now facing the federal Department of Energy, which is debating whether to save part of an old uranium plant in [Tennessee](#). When built during the war, it was the world's largest roofed structure and worked around the clock to concentrate uranium 235.

"If we walk away, we're condemning ourselves to this homogenous experience of fast-food places and big-box stores," said Ms. Kelly of the Atomic Heritage Foundation. "We'll lose part of the fabric that has made us who we are." |



AIP Emilio Segrè Visual Archives

About 1940, John R. Dunning, left, with his cyclotron and two other physicists: Enrico Fermi, center, and Dana P. Mitchell.