

PERSPECTIVE

For alumni and friends of the
UW-Madison College of Engineering

GIFT REPORT 2012

Love of big ideas led inventor to Wisconsin project

Fourteen years ago, Grainger Professor of Nuclear Engineering Gerald Kulcinski sat down for lunch with a fellow member of the National Academy of Engineering during a Washington, D.C., event. The two had never met, but had an enthusiastic exchange of ideas about their respective research interests.

That's common at big scientific meetings, but this was no ordinary chat. Kulcinski's lunchmate was Wilson Greatbatch, then 79, inventor of the first implantable pacemaker, owner of more than 300 domestic and international patents, and leader of a high-technology research and manufacturing business that reinvented implantable and other special battery application technology.

Greatbatch also was, it turns out, an insatiable pursuer of big and far-reaching ideas. And he had found his latest big idea—capturing helium-3 from the moon as an abundant source of fuel for cheap fusion energy on Earth—in Kulcinski's laboratory. Kulcinski's helium-3 research captivated Greatbatch, not only for its energy potential, but also for the logistical grand challenge it posed for space exploration.

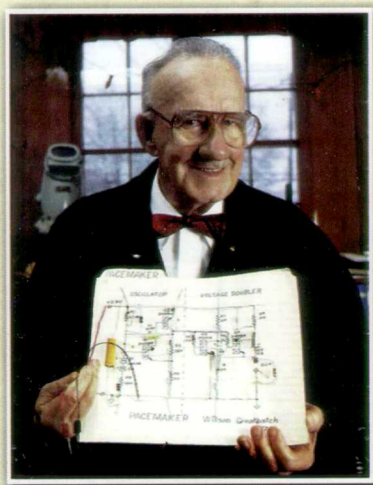
The chance meeting led to a decade-long collaboration between Greatbatch and the UW-Madison fusion engineering team. Greatbatch became a research contributor, public educator, and frequent funder of helium-3 research projects.

And after Greatbatch's death in 2011 at age 92, Kulcinski received an unexpected announcement from the Greatbatch family. The executors of Greatbatch's estate decided to further his energy vision by making a \$750,000 gift from his estate to continue the helium-3 research partnership with Wisconsin. That brought his total investment in the fusion group to nearly \$1 million. "One of the astounding things about Wilson was the fact that he had no prior connection to the University of Wisconsin," Kulcinski says. "But he became very interested in our technology and our students."

Larry Maciariello, Greatbatch's son-in-law, says the Wisconsin story is indicative of how Greatbatch approached life. "That's part of his genius—he had no off switch, even as he became older," he says. "If he had in his mind that something was doable, he would not let go."

Greatbatch designed the first successful pacemaker in 1958 while working in his barn and later perfected the device in partnership with two medical doctors. He founded Wilson Greatbatch Ltd. outside Buffalo, New York, and spent years developing and perfecting the lithium-ion batteries needed to keep pacemakers running safely in patients across their lifespan. "When he started the pacemaker, he saw it as an opportunity to help a lot of people," says Maciariello. "He was always looking at big things—usually things that others thought were too far out or too big to handle. He gravitated to those things."

His first big investment at UW-Madison was to fund a lab upgrade that doubled the fusion reactor's power supply to 200



kilovolts, giving the team much higher fusion rates. He funded other practical equipment upgrades as well as graduate research projects. "It was a very low-key, spontaneous relationship," Kulcinski says. "He was not the kind of guy who was looking for publicity. He was looking for results."

The \$750,000 estate gift will cover two distinct helium-3 projects. The first is to further research on the helium-3 fusion cycle. The second is to support writing a sequel to the 2006 book, *Return to the Moon*, by former Apollo 17 astronaut and helium-3 research collaborator Harrison Schmitt, an adjunct professor of engineering physics.

Greatbatch frequently gave talks to students about energy and space, Kulcinski says, and he understood the power of outreach and translating science to the world. His book funding continues that legacy.

His commitment to education was remarkable. Maciariello says Greatbatch extended free college tuition benefits not only to many of his company employees, but to the children of employees as well. Kulcinski recalls Greatbatch chatting with a UW-Madison graduate student who just completed a fusion research talk. He asked the student how much a semester's tuition cost, and upon hearing the answer, wrote the student a check for that amount.

The Greatbatch family left one final gift for the college. Wilson's last patent, awarded in 2010, relates to his newly adopted discipline—creating direct electrical conversion using the reaction from helium-3. That patent soon will belong to UW-Madison.

—By Brian Mattmiller