



DR. MARK WOODS (A&S '76, GRAD '86) GREW UP KNOWING WHAT IT WAS LIKE TO HAVE LAST-MINUTE ABSENCES FROM THE DINNER TABLE. His father, Dr. Ralph Woods (A&S '49, Med '53), was an obstetrician who routinely was called away from meals and family events to deliver babies. When Mark Woods chose a career in geophysics, he thought he would be immune from such interruptions.

“It was a nice idea anyway,” he said.

He remembers Christmas Eve 2002. Woods and his wife had all the gifts wrapped and under the tree, including a rocking horse for their 2-year-old daughter. Woods couldn't wait to see her face in the morning, but at 5 a.m. he received an urgent call from work. A seismic event had been detected overseas, and Woods was needed to determine whether it was an earthquake or an underground nuclear explosion. Four hours of analysis later, Woods returned home to find wrapping paper strewn about the floor and a smiling 2 year old on her horse.

It was a disappointment for Woods but an acceptable price to pay when your job is helping to keep the world safe.

THINGS THAT GO BUMP IN THE NIGHT

Woods is research branch chief in the Directorate of Nuclear Treaty Monitoring at the U.S. Air Force Technical Applications Center (AFTAC) in Florida. Located on Patrick Air Force Base, AFTAC monitors compliance with several nuclear test ban treaties, including the Limited Test Ban Treaty, the Threshold Test Ban Treaty and the Peaceful Nuclear Explosion Treaty. The center also develops advanced proliferation monitoring technologies to track explosions.

Keeping tabs on who is testing what has become one of the most critical elements of national defense strategy. Since the United States rocked the desert of central New Mexico in 1945 during the secret Manhattan Project — the world's first nuclear test — seven other countries (the former Soviet Union, France, Britain, China, India, Pakistan and North Korea) are known to have successfully developed nuclear weapons. As many as 20 more countries are suspected of developing nuclear weapons. North Korea officials said they conducted an underground test as recently as a year ago.

AFTAC tracks these tests with a global network of nuclear event detection sensors called the U.S. Atomic Energy Detection System. Once the system senses a disturbance underground or underwater, AFTAC analyzes the readings to determine the source.

“If things go bump in the night, we're called in to review it,” Woods said.

Woods is part of a cadre of Saint Louis University graduates who work at AFTAC, which blends military and civilian personnel. More than a dozen SLU scientists work or have worked for the agency since it was activated in the 1950s, and another dozen or so SLU alumni are contractors who work with AFTAC on a regular basis.

“Some days walking into work is like walking into Macelwane Hall,” Woods said.

HAVING THE EDGE

Dr. Robert B. Hermann (Grad '75), the Paul C. Reinert Chair of Natural Sciences at SLU, said James B. Macelwane, S.J., is responsible for SLU's prominent presence at AFTAC. Macelwane established the first department of geophysics in the western hemisphere at SLU in 1925 and revitalized the Jesuit network of seismographs placed at 18 Jesuit universities and colleges across the United States.

When the U.S. Air Force became a separate military service in 1947, Hermann said one of the tasks Gen. Dwight D. Eisenhower assigned the branch was detecting “atomic explosions anywhere in the world.” Air Force

personnel needed advanced training to meet the challenge, and at the time there were only a handful of schools offering it in geophysics, among them the University of California at Berkeley, the California Institute of Technology, Columbia University, MIT and SLU.

“We had an edge because of the hands-on training we could provide students,” Hermann said. “We were the hub of a large seismic network, and Air Force personnel could work with live, high-quality data.”

CLASSIFIED INFORMATION

Dr. Frank Pilotte (Grad '53) was a graduate student in meteorology and seismology when Air Force officers began enrolling at SLU. Macelwane asked him to help with their training.

“Being ex-Air Force, I wondered what the service had to do with reading seismographs, so I asked Father Macelwane,” Pilotte said. “He told me it was classified, and I should just do what I was told. We found out later that the Air Force was using contractors at independent stations to read

seismographs. They wanted to bring some of that work in house and open a scientific agency that could fully analyze data.”

That agency was AFTAC and in 1962 the Air Force hired Pilotte. He spent 37 years with the agency — 14 as director of research (first in geophysics and then in nuclear treaty monitoring) — before retiring in 1999.

During his decades at AFTAC, Pilotte kept the agency's worldwide monitoring stations viable and maintained or established relationships with other countries that had sensor stations and could exchange data. Before Pilotte joined AFTAC, the United States had no coverage in the southern hemisphere. Working with the U.S. Geological Survey, Pilotte established three stations in Africa and three in South America.

Pilotte also was instrumental in designing the U.N. International Monitoring System, a key part of the Comprehensive Test Ban Treaty. The 1996 treaty is an international agreement designed to end the testing of nuclear explosives. (Many nuclear-capable states, such as the United States, have signed but not ratified the treaty, yet they abide by its rules.)

Upon his retirement, Pilotte was praised for laying the foundation for today's vigorous global nuclear treaty monitoring.

“I enjoyed every minute of the job,” Pilotte said. “I traveled a lot and had to put out a lot of fires, but I made friends all over the world. I left with a deep sense of gratitude for having had the opportunity to play a role in such an important mission.”

SENSE OF PURPOSE

Pilotte hired several SLU alumni while he was the director of treaty monitoring of AFTAC, including his replacement, Dr. David Ray Russell (Grad '88).

Pilotte said SLU scientists are attractive for many reasons. He said students leave SLU well trained on the latest monitoring technologies, and they already may have participated in verification research.

AFTAC does not make policy, but its staff members, including Russell and Woods, advise the U.S. Department of Defense, the Department of Energy and the United Nations.

Because the information the scientists are gathering is of a critical nature, Woods said

he is surrounded by the best, most well maintained equipment a geophysicist could want. But the best part of working for AFTAC is the sense of mission.

“The United States needs to know whether other nations are living up to their test ban treaty obligations, and we can provide that information,” Woods said. “So, yes, we have the opportunity to do technical work, but in the Jesuit tradition of service to others, we are providing a service to our nation.” ✨

