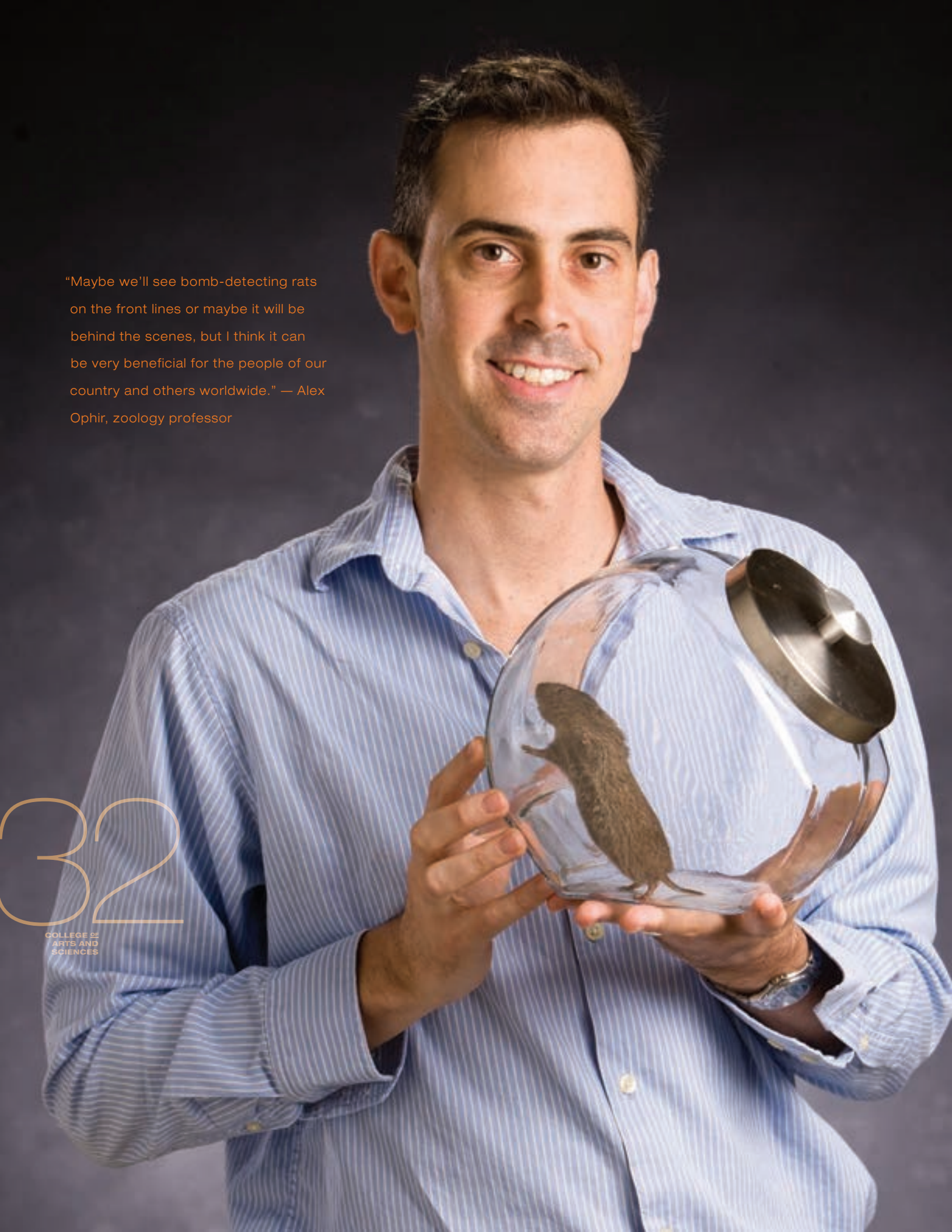


"Maybe we'll see bomb-detecting rats on the front lines or maybe it will be behind the scenes, but I think it can be very beneficial for the people of our country and others worldwide." — Alex Ophir, zoology professor

Rat Research Could Save Lives

STORY BY Stacy Pettit '09 PORTRAIT BY Phil Shockley

OSU zoologist Alex Ophir seeks to understand rats' potential for bomb detection.

From a pencil, pen and notebook to beakers and test tubes, those hustling across the OSU campus can have a wide array of supplies in tow.

But professor Alex Ophir is receiving attention for an addition – much furrier and more mobile than a No. 2 pencil – he hopes will become a very important tool for countries all over the world.

Ophir has won a $740,000 research grant to study the bomb-detection talents of African giant pouched rats, which can grow to be nearly 3 feet long and weigh up to 4 pounds.

With the Department of Defense's grant, much of Ophir's next five years will be dedicated to uncovering the range in behaviors these rats express and what makes their ability to detect land mines and bombs "tick."

"What we want to do is get an idea of the capabilities of these animals, the contexts in which these animals behave in certain ways, and how that might translate if one wanted to start training them for various explosives tasks," Ophir says.

The African giant pouched rat is not the first rodent Ophir won a grant to study. Last year, he was awarded nearly $350,000 by the National Institutes of Health to study the monogamous habits and social behavior of prairie voles, which exhibit human-like behaviors of love toward their offspring and mates.

By studying these rats in the lab as well as in their native habitat of sub-Saharan Africa, Ophir plans to gain a better understanding of what the professor calls "animal personality."

"The idea is that not everybody who enlists in the army is set up to be a sniper," he says. "Some are snipers while others drive tanks. A lot of that is based on the special ability of each individual person. The rats are potentially a lot like that as well."

For example, Ophir says some rats might be born with a special ability to explore open spaces while others might be better equipped to search through tight spaces. Therefore, one rat would be better at searching a mine field for explosives, and the other would be effective in combing through cargo areas.

Although an organization in Tanzania, APOPO (a Dutch acronym meaning Anti-personnel Landmines Detection Product Development), has been studying these bomb-detecting rats since the late 1990s, Ophir says he hopes unlocking this animal's personality could significantly shorten the time needed to train these animals. Ideally, a simple blood test after birth would be able to determine what special ability the rat would have. Then training could begin immediately.

Ophir says these bomb-detecting rats have the potential to save hundreds of people. Not only might American troops use the rats to track down roadside bombs, but also people in countries across the map could put to rest the fear of being killed or injured by landmines, some of which have been hidden underground for decades.

"Maybe we'll see this on the front lines or maybe it will be behind the scenes, but I think it can be very beneficial for the people of our country and others worldwide," Ophir says.

CONTINUES

LEFT

OSU zoologist **Alex Ophir** holds a vole, of which he is researching the monogamous and social behavior. Ophir often uses rodents in his research. He has recently received a grant to study the bomb-detection talents of African giant pouched rats.

BELOW

OSU zoologist **Alex Ophir** holds an African giant pouched rat, of which the College of Arts and Sciences professor is studying the bomb-detecting talents. Photo courtesy of Alex Ophir

As an undergraduate, Ophir attended the University of Texas for a degree in psychology and anthropology. At Texas, Ophir worked in a psychology department research laboratory focused on the interaction of hormones and behaviors. He had a chance to conduct independent research on frog aggression and vocal behavior. The link between animals, science and psychology had Ophir hooked.

"It just captivated me," he says. "I knew I had to do this for the rest of my life."

Ophir next attended Canada's McMaster University, noted for its programs in animal behavior and evolutionary psychology.

"I started out interested, and then as I began to research and learn more, I became even more interested," he says. "As I gained more of an education, it all sort of folded into one."

With Ophir's father being a radiology professor, science has always been a big part of his life.

"During his Ph.D. studies, my dad developed a significant amount of what makes ultrasound technology useful. As a part of his research he used my mom and myself to capture images that he later used in his publications before I was even born," Ophir says. "So I've really had science all around me my whole life."

As he grew up in Houston, the kitchen table conversation was typically about the ins and outs of academic life. The conversations that stand out to Ophir are those with his father that groomed him for a life dedicated to science.

"He'd implicitly teach me about the scientific method," Ophir says. "He trained me to use it on anything."

As a young child, when Ophir asked his father what made marigolds grow, his father replied by asking what he thought made the flowers grow. Then the duo would carry out experiments to determine a possible answer.

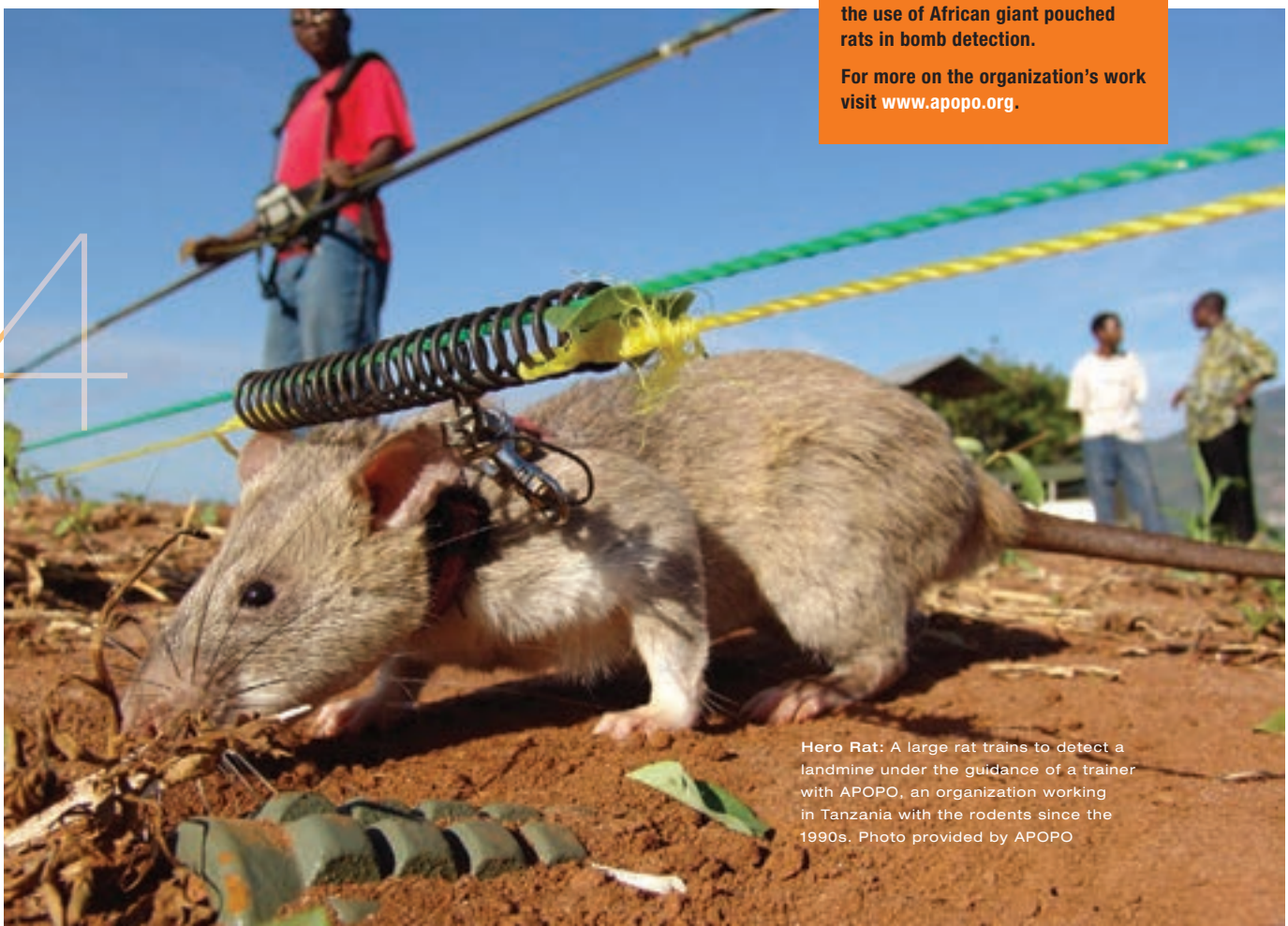
"We'd use fertilizer, and it was a huge breakthrough," Ophir says laughing.

Ophir, who joined the OSU faculty in 2009, hopes to make another breakthrough with his research on the giant African pouched rats. As he begins his research, he says he could not have asked for a more encouraging and helpful place.

"I don't think I would have any of these opportunities if I wasn't at Oklahoma State." &

OSU professor Alex Ophir will be building on research that has been ongoing for more than a decade. In 1998, the Belgian non-commercial company APOPO began researching the use of African giant pouched rats in bomb detection.

For more on the organization's work visit www.apopo.org.



Hero Rat: A large rat trains to detect a landmine under the guidance of a trainer with APOPO, an organization working in Tanzania with the rodents since the 1990s. Photo provided by APOPO