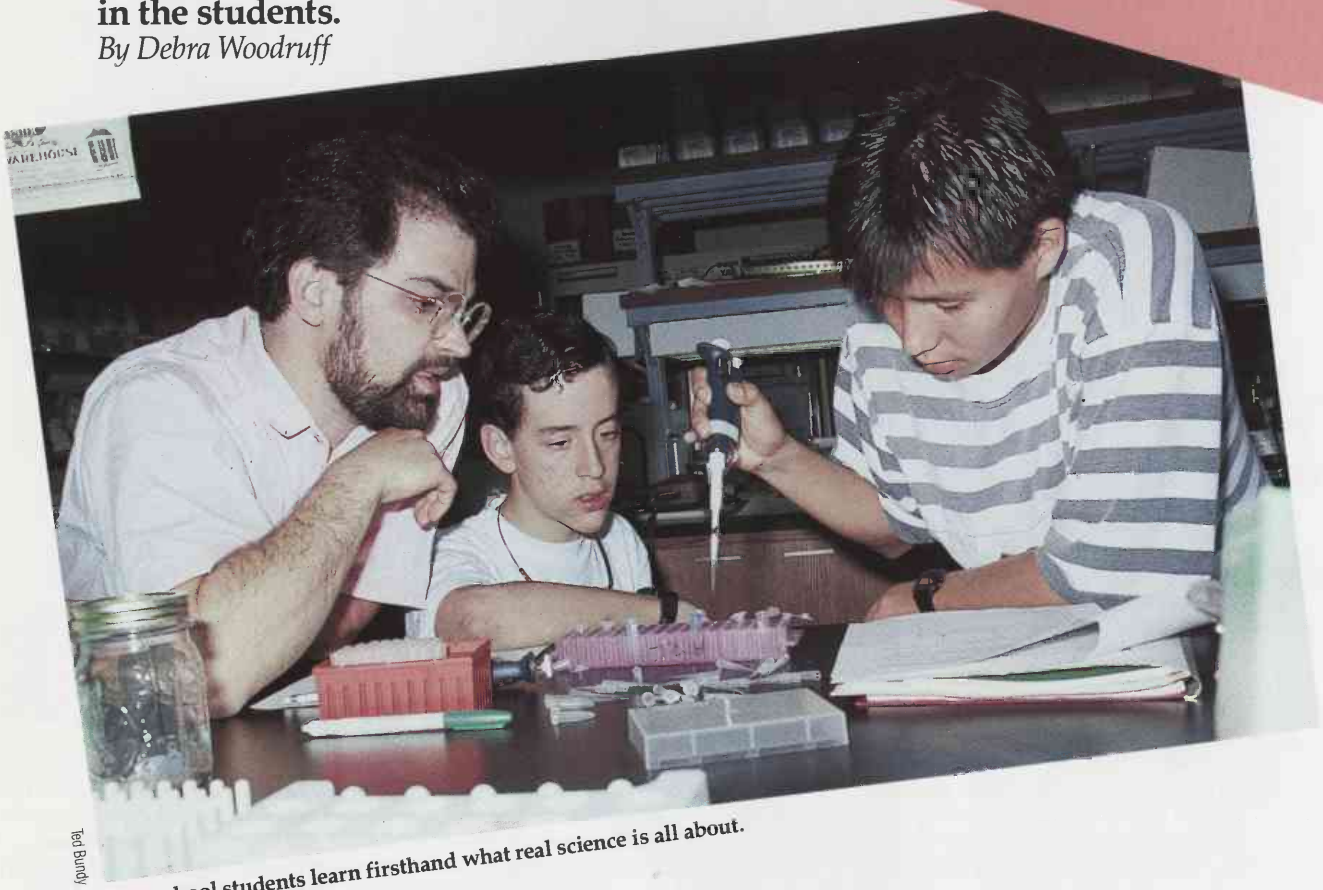
The Science Program

Being on campus builds confidence in the students.

By Debra Woodruff

Horizons Unlimited



Ted Bundy

High school students learn firsthand what real science is all about.

"We're trying to overcome some of the preconceived ideas of science that kids get in school."

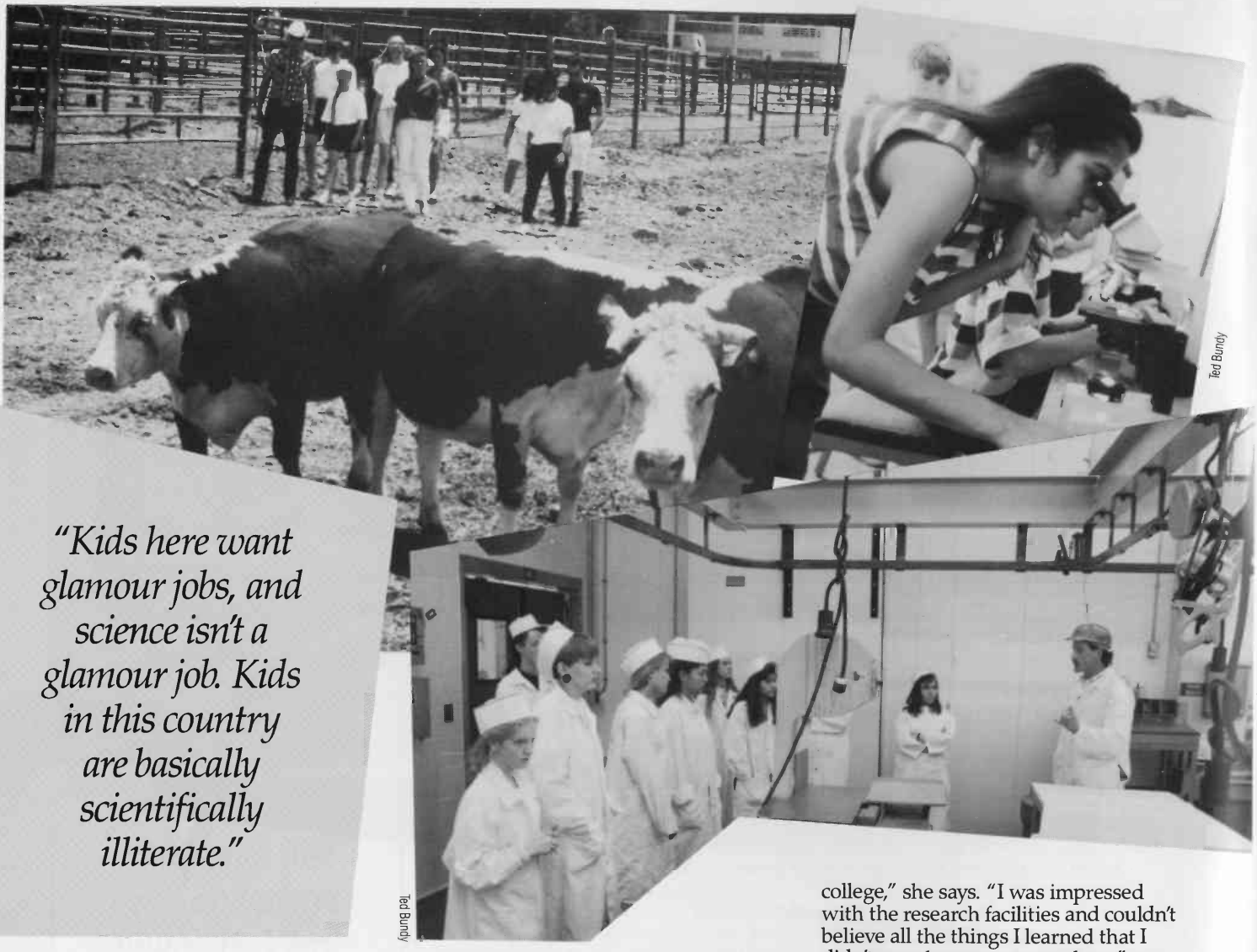
For the past three years, the top juniors in the state have been the target of thousands of brochures inviting them to apply for a one-week residency at The University of Arizona College of Agriculture to experience, first-hand, applied agricultural science. This past June, 93 students, chosen from a field of 121, participated in "The Science Program"—a week of lectures, labs and campus life, all structured to highlight agricultural disciplines—under the umbrella of Horizons Unlimited.

"We're trying to overcome some of the preconceived ideas of science that kids get in school," said Paul Kohn. He came to the UA in 1989 from Cornell University to become the program coordinator for Horizons Unlimited and an academic advisor. "We want to un-do learning the periodic table without ever finding out how it's applied to real science."

"And while we're at it," Kohn said, "we'd especially like to increase their exposure to more meaningful applied science, more options than just a generic biology degree. If you get your degree in plant sciences, for instance, you can still go to medical school, but you'll also probably have a good job offer when you finish your undergraduate education."

William Hanekamp, the assistant dean and administrative head of the Horizons Unlimited program, acknowledges a growing concern about the shortage of freshmen majoring in science at the UA, and the further loss from attrition during the four years of college. He noted that the Science Program was designed to spark an interest in the varying and on-the-edge research that students often don't even realize is available for them to study.

Sparks of interest were definitely flying in Randy Ryan's lab one day during the Science Program week. He was demonstrating the advanced technology of genetic engineering research, specifically the gene gun. A carefully structured week of experiments allowed students in the genetic engineering lab to be actively involved in



Ted Bundy

Ted Bundy

Ted Bundy

"Kids here want glamour jobs, and science isn't a glamour job. Kids in this country are basically scientifically illiterate."

research steps leading to concrete results. This day they were learning how to transform a tobacco plant with DNA from another plant using the "gun," perhaps making the plant more disease or insect resistant.

A group of eight students huddled around as they watched the microprojectiles being prepared to be shot into the plant. Each student was allowed to load the gun and carry out the procedures of this new technology that has revolutionized genetic engineering.

"The gene gun is a sexy device," Ryan said. "We're shooting something to make it better—the implications of that are barely scratched upon. It's exciting for the students to see technology that's new and novel. It's an important component in attracting top students."

It certainly attracted student Saul Gonzales from Nogales High School, who said the genetic engineering labs were, for him, the best part of Horizons Unlimited.

"I was thinking about going to school in California," he says. "But now that I've seen the facilities and the research there, I'm steering toward the UA. I'm definitely thinking about studying genetic engineering."

Gonzales currently works at a produce company in Nogales. He says he has often wondered about the genetic makeup of the fruit and vegetables.

"The week of the Science Program answered a lot of my questions and gave me the best view of genetics," he says. "I saw it like it really is, how it's really used."

Maria Truong from Kofa High School in Yuma agreed that the genetic engineering labs were among the most interesting in the program. She also went home with an entirely different impression of a large university.

"I thought at such a large university the instructors wouldn't be as helpful, but they went through everything step-by-step," Truong says. "I liked the hands-on opportunities I had."

Jennitte Stevens from Mountain View High in Tucson said the gene gun experiment was her favorite.

"Now I want to go into genetics in college," she says. "I was impressed with the research facilities and couldn't believe all the things I learned that I didn't even know were out there."

Such positive responses should be music to Randy Ryan's ears, since he admits he is generally worried about science education in this country.

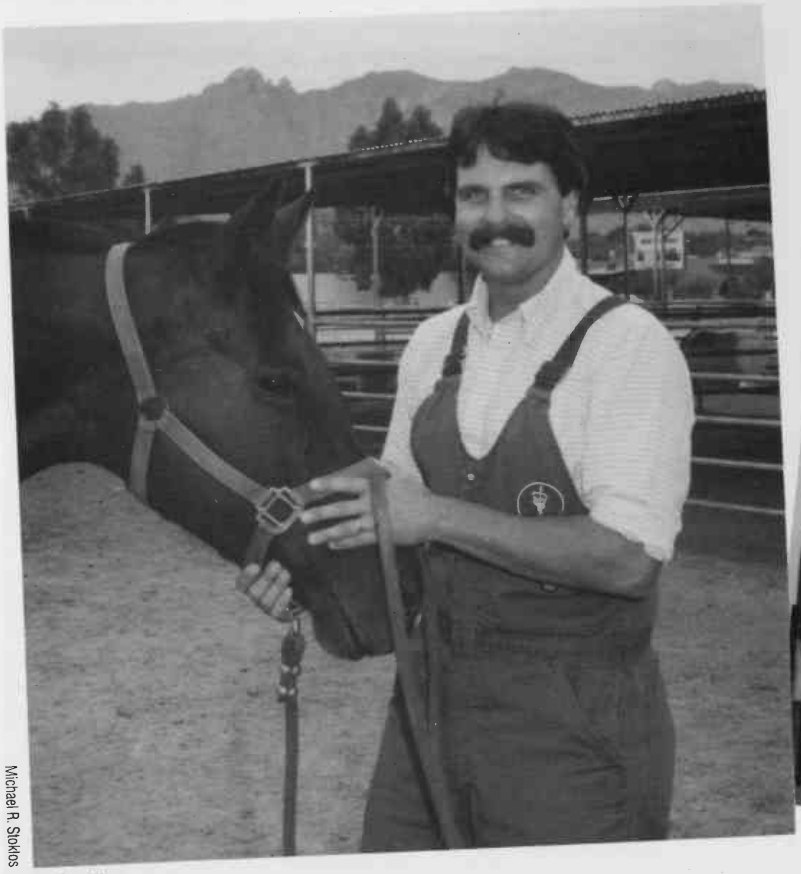
"We have to import people from other countries to fill our science needs," Ryan says. "Kids here want glamour jobs, and science isn't a glamour job. Kids in this country are basically scientifically illiterate. Only the most gifted even understand DNA, which is what binds us all together."

Peder Cuneo, whose lab involved veterinary animal health at the UA dairy farm, shared some of Ryan's concern about the level of scientific training in this country.

"The students in my lab were pretty naive," he says. "They asked good questions, but they haven't had a lot of training to think for themselves or have well-rounded views."

Nine girls and one boy spent the morning at the dairy farm with Cuneo viewing the milking production and some of the ongoing research developed by graduate students. The science program students expressed their con-

Horizons Unlimited



Michael R. Stoklos

Peder Cuneo

Michael R. Stoklos

Paul Kohn (left) and William Hanekamp

cerns—why couldn't the dairy cows nurse their calves longer?—why were the calves kept in small pens?—and why were cows sent to slaughter if they aren't productive milkers?

"It's disheartening to me to think our society makes it so easy not to look at agricultural production systems," Cuneo says. "These students acted like meat just appears in the grocery store all wrapped in plastic."

He hopes the exposure to the UA production systems gave the students something of a new awareness during the Science Program.

Certainly Jan Applegate, who attends Alhambra High School in Phoenix, bore out Cuneo's gloomy outlook. She took Cuneo's lab because she hopes to go to medical school and it was the most biologically oriented course. But for the most part, she was disappointed in the dairy—she didn't like the dirt and smell of the cattle—she disapproved of some of the everyday kinds of research.

Other students felt more positive about their experiences. Ariel Hiller from University High School in Tucson decided to attend the Environmental Protection lab because she thought the course would help her better define her goals.

"I didn't think the UA had much to offer, but I found out it does, even though it's not exactly what I want to study," Hiller says. "They really concentrate on hard science here."

Edward Corbin was in the lab headed by Elizabeth Bernays, the head of the Department of Entomology. Corbin signed up for the course because he loves biology, and his hopes were fulfilled.

"I understand the importance of studying insects now," Corbin says. "I enjoyed the experiments and never felt lost—every step was well-explained." The junior from Desert Christian High School says he feels much more excited about the UA because now he's seen the campus and has a feel for college life.

"Being on campus builds confidence in the students," coordinator Kohn says. "They learn what it's like to be in a college-level class with a professor, and they're not overwhelmed even by the bureaucracy. It's a good orientation for those who decide to come to UA, and even for those who go somewhere else. The experience is a maturing one."

Kohn says his office will become a continuing resource center for the Horizons students who do come to the UA, so they know there is always a place they can go for help and advice. There is no way of knowing yet how many of this summer's students will decide to attend the university, but Kohn is particularly pleased by the participation of 61 percent of the state's high schools. He's also proud the program attracted so many often underrepresented minority students.

It took hard, year-around work. Kohn's assistant, Sonia Cruz, visited 17 different high schools this past year to attract students to the program. She made minorities aware of the scholarships available through the Howard Hughes Medical Institute grant, from the U.S. Department of Agriculture, 4-H youth programs, and from B.P. Cardon, former college dean. This summer, nearly $8,000 in scholarships was distributed to the students.

"Most scholarly students don't envision themselves ending up at a state school," Kohn says. "They have a tremendous opportunity here to learn from others with entirely different backgrounds. It's such a diverse student body. And the Science Program helps them realize that the University of Arizona is a leader when it comes to education."

Contact William Hanekamp and Paul Kohn at the Office of Instruction, 211 Forbes Building, Tucson, AZ 85721, or call (602) 621-3613. Contact Randy Ryan in the Department of Plant Sciences, 204 Forbes Building, Tucson, AZ 85721, or call (602) 621- 9428. Contact Dr. Peder Cuneo in the Department of Animal Sciences, Campus Agricultural Center, 4101 N. Campbell, Tucson, AZ 85719, or call (602) 621-3454.