



**Native skills.** Kath Handasyde (left) shows student Natalie Briscoe how to attach a radio collar using a stuffed wallaby.



## AUSTRALIA

# ‘A Crisis in Student Quantity and Quality’

Kath Handasyde enlists native species, assertive Americans, and anything else on hand to rekindle a passion for science among undergrads

**MELBOURNE, AUSTRALIA**—Tromping down an academic hallway with her flyaway shock of reddish-gold hair and a thin braid shooting out from behind one ear, Kath Handasyde looks like she’s just wandered in from the Australian bush. In fact, she has. But the University of Melbourne (UM) ecologist, who specializes in Australia’s endangered native mammals—particularly the egg-laying duck-billed platypus—is already hunting for another of Australia’s endangered native species: undergraduate science majors.

She finds them clustered around a low table in the Zoology Department tearoom. Devi Stuart-Fox, their instructor, lets the undergraduates do the talking. “We’re using guppies to measure the evolutionary tradeoff between behaviors for attracting mates versus avoiding predators,” says Danial Hunter, a third-year student. They’re hoping the project will result in a peer-reviewed publication.

Back in her office, Handasyde, a compact, 48-year-old, fast-talking ball of energy, raves about her students. “In a good year, up to half of the undergraduate projects produce a publication,” she says, “and many students even publish two papers before they graduate.” That impressive track record is partly due to what Handasyde calls “hands-on, research-focused teaching,” including exposing all zoology majors to the trials and tribulations of grant writing. “It was extremely useful,” says one of her students, Natalie Briscoe, who successfully persuaded a panel of classmates to

fund an imaginary research project—before winning a genuine \$5500 government award for a developmental study of caterpillars.

But Handasyde and her colleagues worry that such high-achieving science undergraduates are becoming increasingly rare. “We’re facing a crisis,” says Peter Rathjen, the UM dean of sciences, “both in terms of quantity and quality of students.” The overall fraction of Australian undergraduates choosing science-related fields has held steady at about 20%, but growth in specialized applied fields, such as information technology, has “masked” a steady decline in the basic sciences, he says.

That decline has had a corresponding effect on the number of faculty positions because Australian universities, including UM, receive government funding on a per-student basis. “We’re facing a serious challenge,” says Rathjen. Mathematics has taken the biggest hit, with a 30% decline in faculty slots across the country over the past decade.

Growing up in a rural area, Handasyde decided at age 6 to become a zoologist. She tries to emulate the “passion and excitement” that she experienced 30 years ago as an undergraduate in the same department. “The classes were smaller, and staff were less loaded with the huge diversity of modern tasks that we undertake now,” she says.

But that happy story doesn’t seem to hold true elsewhere. To keep their classrooms filled, many science departments have needed to lower entrance requirements. “In effect,”

says Rathjen, “universities are taking in students to study science who do not have the preparation, and possibly ability, to complete courses of proper rigor.” He says that high school students have been allowed to drift away from taking challenging courses such as calculus, and teachers lack incentives to upgrade their knowledge.

But it isn’t all gloom and doom. One positive trend in the undergraduate ranks, says Handasyde, is the massive influx of overseas students in the past 5 years. Most come to Australia from newly affluent eastern Asia with their sights set on careers in business, biotechnology, engineering, and medicine. The added ethnic diversity—a quarter of Australian undergrads now hail from abroad—“really opens the world for our students,” she says.

About 6% of the overseas students come from the United States, a trend that brings a smile to Handasyde’s face. “What we all love about the American students is how much more assertive they are in the classroom than us Aussies,” she says. She avoids using the moniker “good-natured loudmouths”—a common term here—but her point is clear. “They spark conversations [in classes] where teachers usually struggle to get students to interact.”

At the same time, the increasing diversity hasn’t corrected a serious underrepresentation on campuses of indigenous people. Although as many as 5% of Australians are indigenous, they make up only 1% of the student body. And science is near the bottom of their list of majors, says Ian Anderson, director of UM’s Centre for Health and Society. Poor preparation is one reason, he says, along with a lack of indigenous leaders in academia. Handasyde agrees. There is no easy fix, she says, but “what we badly need are more success stories.”

One piece of good news arrived this spring with the announcement of a budget windfall. The government is setting aside an extra \$4 billion next year as an endowment, with the interest going toward university infrastructure upgrades. That will be a boon to science, says Rathjen, “because our teaching and lab facilities are stuck in the 1960s and ’70s.” The government is also revising its formula for funding universities, with a significant boost for scientific courses, particularly those involving labs. “I can’t believe it’s taken this long,” says Rathjen, “but we’re finally coming around to seeing that our future depends on our scientists.”

—JOHN BOHANNON