One to One

As students explore opportunities, mentors provide personal support

by Gary Dulude Photos by Jim Folts

Most students come to college as works in progress, their interests only partially identified, their potential still to be realized. And as they explore and develop that potential, many students find something equally important: a mentor.

OSU offers an "opportunity-rich environment" for mentoring; at the same time, it's an informal and organic process, says Larry Roper, vice provost for student affairs. Inspiration can come from a faculty or staff member who sees promise in a student, or a student may find it in a teacher or researcher.

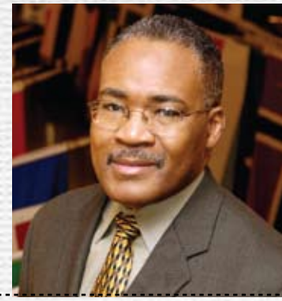
Regardless of how they begin, mentoring relationships are characterized by intensity and openness. Mentors may offer specific advice or simply listen without judgment. Other times, they may have to tell students what they don't want to hear.

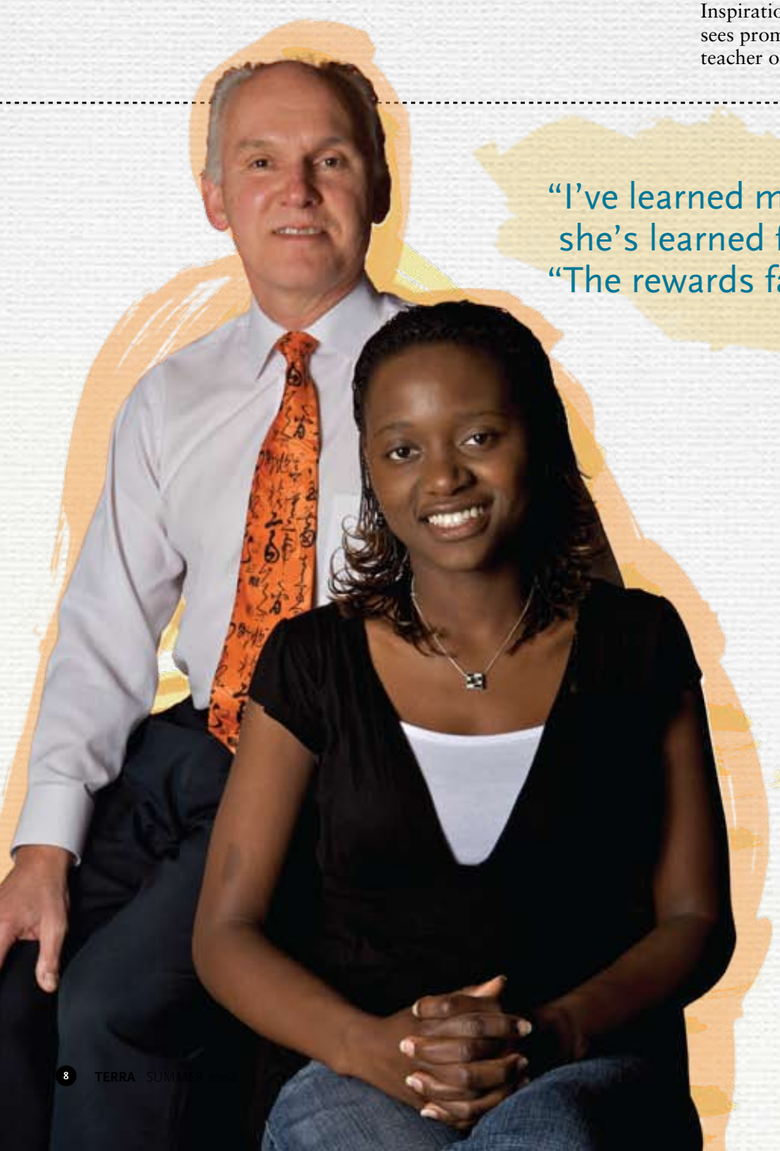
"Good mentors seem to know what voice is appropriate at what time to get students' attention and help them along the way," Roper says.

Roper's own experience being mentored in college, by a Russian literature professor and his track coach, remains influential more than 30 years later. The relationships taught him about balance and gave him confidence.

"They helped me uncover my best possible self, always looking for the possibilities in my life that weren't clear to me," Roper says. "In the places where my ability didn't match the potential, they helped me develop the competence I needed." terra

(photo: Dennis Wolverton, Oregon Stater magazine)





"I've learned more from her than she's learned from me," Bell says. "The rewards far exceed the effort."

The mentor Chris Bell, associate dean, College of Engineering

The student Eunice Naswali, senior in electrical engineering from Kampala, Uganda

Making a difference Bell was only an "incidental mentor," he says. With his wife and grown children, he had volunteered through Crossroads International, a community volunteer organization in the Office of International Programs, to serve as a "friendship family" when Naswali came to the United States in 2004. Although his specialty is in a different discipline, civil engineering, Bell encouraged her early on to pursue an internship in the Multiple Engineering Cooperative Program (MECOP). More than 100 companies in Oregon and Washington offers students opportunities through MECOP.

Naswali has completed her first internship at Mentor Graphics in Wilsonville, and she is beginning her second at Vestas Americas in Portland this summer. Vestas is one of the world's largest wind-energy companies, and Naswali hopes the experience will help her in a future career back in Uganda, tackling the country's problems with power generation and distribution to remote areas.

The mentor Ann Zweber, senior instructor, College of Pharmacy

The student Channa George, second-year pharmacy student from Ten Sleep, Wyoming

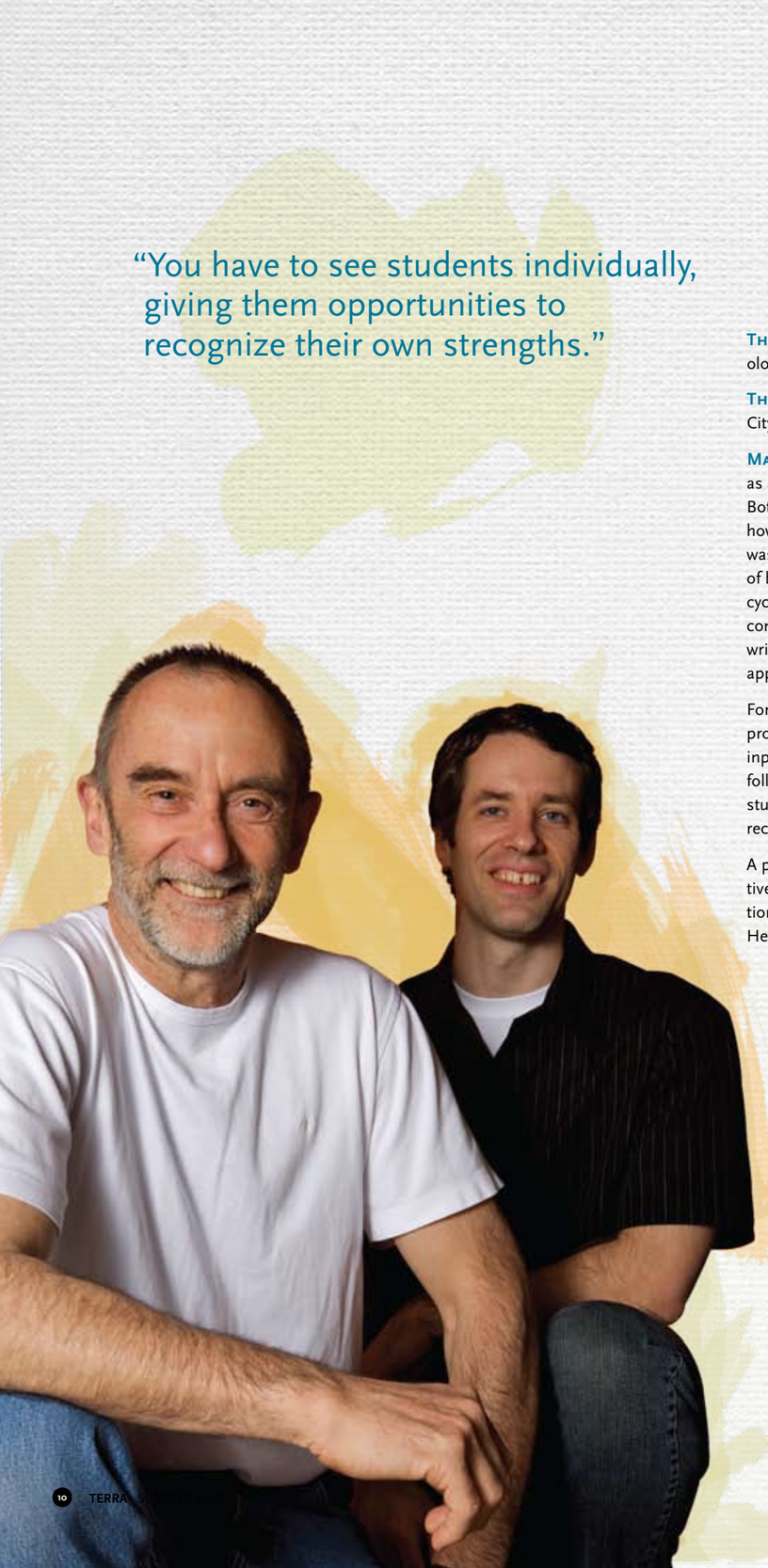
Making a difference Take your prescription to the Bi-Mart pharmacy on 9th Street in Corvallis, and you might find Zweber and George working side by side. Zweber works in the pharmacy part time to "maintain my practice and credibility with students," she says. George is completing an internship as part of the pharmacy program.

George says working with Zweber gives her a role model for how to care for patients, "how she talks to them, listens to them and helps them." The internship experience also shows how pharmacists are becoming more involved with patients and more responsible for the outcomes of medications.

"Ann gives me a lot of confidence. She makes me feel I can do whatever I want to do," George says. "I want to be like her when I'm a pharmacist."

"Ann gives me a lot of confidence. She makes me feel I can do whatever I want to do," George says. "I want to be like her when I'm a pharmacist."

"You have to see students individually, giving them opportunities to recognize their own strengths."



The mentor Peter Bottomley, professor in microbiology, College of Science

The student Shawn Starkenburg, Ph.D. '07, Rapid City, South Dakota

Making a difference As a Ph.D. student and then as a post-doctoral researcher, Starkenburg worked in Bottomley's lab for almost five years to understand how bacteria process nitrogen in fertilizers and wastewater. He helped to map the genome of a type of bacteria that plays a crucial role in the nitrogen cycle. Although Starkenburg had worked in labs before coming to OSU, Bottomley helped him to hone his writing skills and "to take ownership and creatively approach the research," Starkenburg says.

For his part, Bottomley sees mentoring as a learning process with different levels of management and input. "It's very difficult to have one model that you follow with all students," he says. "You have to see students individually, giving them opportunities to recognize their own strengths."

A participant in OSU's Subsurface Biosphere Initiative, Starkenburg received a National Science Foundation fellowship to study the genomics of nitrification. He is now working at Invitrogen in Eugene, Oregon.

Devoted to Nano

The submicroscopic search for a better battery

Caption about printer sequat ulluptatummy nim nit utpat. Ut lam nullam nonsequatum adigna consed (Photo: Karl Maasdam)

Undergrad Anna Putnam is squirming. The interviewer has touched a raw nerve in the chemical engineering major. "You're digging deeply into my life," she says, shifting in her chair. Her confession comes with reluctance: "My first term at OSU, I struggled in math." Pressed, she admits the worst: "I got a C in vector calculus."

For the University Honors College student who had breezed through Advanced Placement calculus and chemistry at Oregon's Clackamas High School, a grade of "average" was a jarring wakeup call. "Before I got to the university," the 2005 senior class valedictorian explains, "I never had to study very hard."

In the three years since that rude awakening, nothing less than an A has darkened Putnam's grade report. She has gone on to collect scholarships like most students collect songs on their iPods. The American Engineering Association Scholarship from Intel and OSU's Presidential Scholarship are among them.

Now, Putnam has advanced from the front of the class to the front edge of innovation, where chemical engineering meets nanoscience and "drop-on-demand" printing technologies. As a research assistant for Professor Chih-hung "Alex" Chang, Putnam is fabricating a "nanostructured" electrode for a new generation of lithium ion battery. An initiative of ONAMI (Oregon Nanoscience and Microtechnologies Institute) in collaboration with Pacific Northwest National Labs (PNNL), the project's ultimate goal is a revolutionary new battery: smaller, lighter, faster, tougher. The U.S. Army — eager to equip soldiers with more compact, lightweight, durable gear — is funding the research. And Hewlett-Packard, a leader in ink-jet design for novel applications in labs and factories, has donated a research-grade thermal printer to the effort.

The jumbled micro- and nano-materials lab in Graf Hall is Putnam's base camp 20 hours a week. As comfortable with ultrasonicators (for breaking up particles) and vacuum furnaces (for superheating chemicals) as other people are with video players and microwave ovens, she has found a way to synthesize lithium iron phosphate, a compound with superior properties to the nickel cobalt or lithium cobalt used in most batteries today. Now, aided by the advanced electron microscopy capability at Portland State University (for viewing nanostructures) and the HP thermal printer (for creating imperceptibly thin layers of nano-materials called "thin films"), Putnam is taking the next step toward better batteries.

With financial backing from the OSU Research Office's Undergraduate Research Innovation Scholarship Creativity grant, she will spend the summer of 2008 making nanoporous thin-film electrodes in various shapes and thicknesses on the HP printer.

Professor Chang describes Putnam as "devoted to the field of nanotechnology." It was, in fact, one of Chang's ONAMI colleagues, Jun Jiao of PSU, who serendipitously led Putnam to nanoscience. During Anna's last summer in high school, she heard about Saturday Academy's Apprenticeship in Science and Engineering from a friend. The Portland-based program aims to pull more girls and minorities into the sciences. Putnam didn't know it then, but her career plans were about to morph. Her summer studying the conductivity of carbon nanotubes in Jiao's lab "changed my life," she reports. When the internship started, she wanted to be a K-12 teacher. When it ended, she was set on becoming an engineer.

Although prestigious private college Harvey Mudd dangled a hefty scholarship, the small California college's status as one of the nation's premier engineering schools couldn't compete with the broad diversity of students and opportunities available through Oregon State. One of those opportunities came along the summer after her freshman year, when she studied nano-treatments for breast cancer in the lab of PSU chemist and ONAMI researcher Scott Reed.

"I designed my own experiments making porphyrins and gold nanoparticles and quenching them together," she explains matter-of-factly.

A star in the College of Engineering's K-12 outreach and mentoring program, Putnam wows high school girls with her "real and vibrant" personality, showing them that it's "OK to love math and chemistry, and that it doesn't make you a 'geek'!" says her first-year adviser Professor Willie "Skip" Rochefort, who actively recruited Putnam to OSU.

As for that hated C in vector calculus, that intolerable stain on Putnam's near-perfect GPA: Soon it will be only a painful memory. She is retaking the class. When she applies for graduate work at MIT or Berkeley, she intends that nothing average will blot her resume, or her prospects.

—Lee Sherman