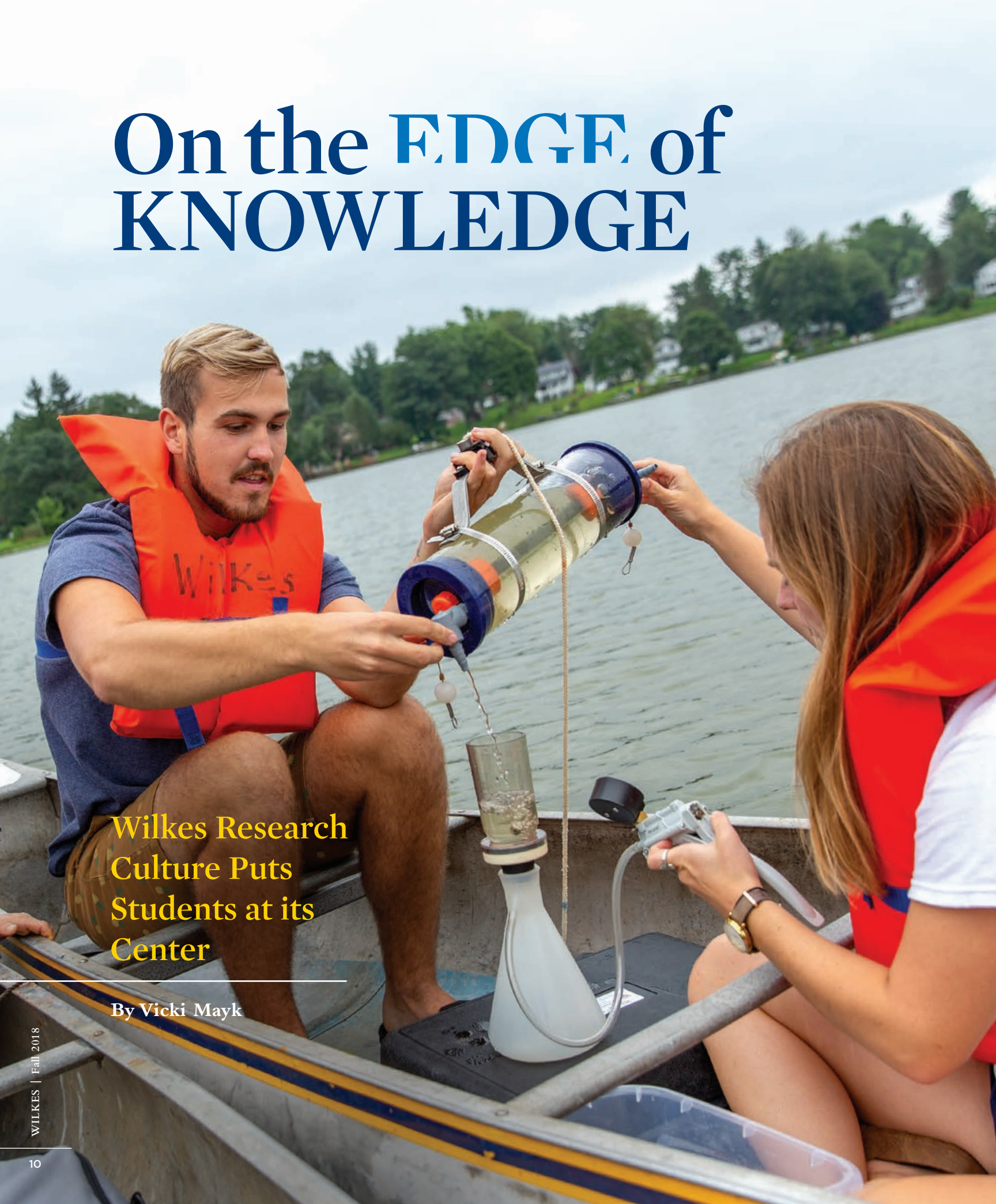
On the EDGE of KNOWLEDGE



Wilkes Research Culture Puts Students at its Center

By Vicki Mayk

Junior environmental engineering majors Scott Heffelfinger and Jillian Weston collect water samples from North Lake in Sweet Valley, Pa., to measure nitrate and phosphate levels. PHOTO BY KNOT JUST ANY DAY

When Amanda Schall '17 graduated from Wilkes, she received a present from Jeff Stratford, associate professor of biology.

It was a machete engraved with the Wilkes logo, Schall's name and the words "Stratford Lab Legends." The memento commemorated the four years she spent as a student researcher in his lab. Stratford, who is an ornithologist, is assisted by students as he studies environmental impacts on bird populations, food webs and other ecology-related topics.

"We had used the machetes in our field work for our research projects and it was kind of a funny, thoughtful gift," Schall explains, adding that fellow alumna Chrissy Shonk '17 also received one. The tool routinely is used by Stratford's students as they cut through brush to find birds' nests and other specimens.

Both biology majors worked with Stratford year-round. After graduating, Schall took the machete with her to Penn State College of Medicine in Hershey, Pa. Shonk is now at the Cummings School of Veterinary Medicine at Tufts University in North Grafton, Mass., where she is in her second year of veterinary school. Although neither chose a research career, they praise its value in their undergraduate program.

"It definitely gave me a lot more confidence to pursue something that I was interested in and the ability to know that I could do it, that is for sure," Shonk says

Schall and Shonk's experience reflects opportunities that are integral to undergraduate education at Wilkes. From the time students step on campus, they become part of a University with a research culture. Students assist faculty with grant-funded research. Or they complete their own projects, as many majors require students to complete research to earn their degrees.

Wilkes' research emphasis is unique for a university its size. Institutions who tout a research culture are most often large universities, where research primarily involves graduate students. What's more, student involvement is incidental to the research at those schools. Wilkes faculty are quick to note the difference.

"At Wilkes, it is a research culture with students at its center," states Amjad Nazzal, associate professor of physics. "We are helping young men and women to discover themselves." His research involves two students—junior mechanical engineering and physics major Sam Lizza and sophomore chemistry/premedical major Stephanie Ko. The project involves synthesizing crystals and exploring their optical properties.

Wilkes' commitment to research opportunities attracts prospective students. Leah Thomas, a senior premedical/biology student, says it was a deciding factor when she transferred to Wilkes as a sophomore. "Other schools didn't have the research opportunities that we have at Wilkes," she says.

AN EVOLVING EMPHASIS

During the past 20 years, there has been an evolution and strengthening of the research culture at Wilkes, says Mike Steele, H. Fenner Chair of Research Biology and head of the biology department.

"We've always been interested in involving students in experimental questions," Steele says. He recalls that Les Turoczi, former chair of the biology department, made a conscious decision to strengthen that focus.

The benefit to students drove those decisions. "Research makes them better critical thinkers," Steele says. As students graduate and pursue advanced degrees, they excel above their peers, he adds.

Several external grants have funded student research. Two—one from the National Science Foundation in 2000 and a second from the Howard Hughes Medical Institute in 2008—were among many that fueled research opportunities in biology. Since then, the University has taken the lead in providing support that encourages student research involvement in all disciplines.

Anne Skleder, provost and senior vice president, says that Wilkes' commitment to support research is reflected in its Gateway to the Future strategic plan. "One of the major goals of the strategic plan is excellence in academic programs, and it calls for support for undergraduate and graduate students to participate in faculty-sponsored research and scholarly activity," she says.

That support has taken several forms. One was a $1 million commitment to fund faculty research projects. Preference for funding is given to those involving students. Another source is University Mentoring Grants, which underwrite everything from student stipends in summer to the cost of travel to present research with faculty at international conferences.

Support also comes from endowed scholarships and funds which underwrite student opportunities on campus, off campus and even abroad. (Please see the accompanying story on page 14 about alumni support for student research.) Other funding comes from myriad places, including the academic deans of Wilkes' seven colleges and schools and from specific academic departments. The results of the increased institutional support are reflected in an annual research and scholarship symposium. Introduced in 2017, the multi-day event features more than 100 presentations by faculty and students.

SUMMER RESEARCH COMMUNITY

A unique part of Wilkes' institutional support enables students to remain on campus in summer to assist with faculty research. In addition to receiving stipends offsetting the loss of wages they might have earned from summer jobs, students get free campus housing. It is a perk few schools provide for undergraduates. More than 50 students participated in summer 2018. The result is a robust summer research community. It includes weekly meetings for biology students—informally dubbed "pizza Wednesdays"—where the undergraduates take turns presenting their work to their peers.

Biology Professor Kenneth Klemow, center, surrounded by members of his student research team, points out varieties of plant life growing around the Williams Transco Pipeline, a natural gas pipeline. Klemow is researching the impact of pipelines on native plants. PHOTO BY KNOT JUST ANY DAY

Wilkes Students Shine at International Conferences

Wilkes students present research at international professional conferences in locations as diverse as Singapore, New Orleans and Hawaii on topics covering an array of scientific disciplines. Their experiences at these conferences have one thing in common.

"We couldn't find any other undergraduates presenting at the conference," says senior Leah Thomas, who accompanied Professor Linda Gutierrez to the European Society of Medical Oncology conference in Singapore in 2017.

The fact that Wilkes students frequently emerge as the only undergraduate presenters at these prestigious events further underscores the unique opportunities available at the University. And even more opportunities can emerge as a result of attending the conferences.

Such was the case with the team of students who accompanied biology Professor Kenneth Klemow to the Ecological Society of America's August 2018 conference in New Orleans. Klemow was accompanied by a team of students that included juniors Jillian Weston, Scott Heffelfinger, Amber Gruhosky and Cassidy Hyde. They presented a poster on research that assessed the impact of a natural gas pipeline on native plant species. Using a site where the Williams Transco Pipeline traverses property owned by Wilkes, student teams monitored plant growth. Using a one-foot-by-one-foot frame, the students viewed plants in 120 plots, monitoring them three or four times a week from May to August.

The poster presented at the ecological conference boasted a clever title: "Natural Revegetation on Natural Gas Pipelines in NEPA (Surprise: Natives Win!)." It explained results showing that plant species native to the area were not impacted by the presence of the pipeline.

Klemow says that the poster drew higher than usual attention in a room with literally hundreds of others. When he checked in with the students manning the table, he learned that they received some surprising feedback. "They said, 'By the way, there was a person from a journal, *Restoration Ecology*, and she said they'd like to see us submit our manuscript,' " Klemow says. A second visitor from a research institute had left her business card, suggesting that they apply for funding to continue the research.

The students seemed matter-of-fact when they shared this news with Klemow—who says it is not typical. What made a bigger impression was the question they received frequently from conference attendees: "When are you going to finish your Ph.D.s?"

"It's one of my favorite summer jobs I've ever had," says junior environmental engineering major Scott Heffelfinger. He worked with biology Professor Ken Klemow in 2017 and returned in summer 2018 to work with Holly Frederick '93, associate professor of earth and environmental science. Frederick's team also included junior environmental engineering majors Kaitlin Sutton and Jillian Weston. The three spent the summer collecting water samples at North Lake in Sweet Valley, Pa., near Wilkes-Barre. They evaluated the samples to assess how nitrate and phosphate levels were affecting algae bloom, which impacted the use of the lake for residents.

"This project was interesting because it had the students out at a site where the residents are interested in what is happening to the lake," Frederick says. "As we would be sampling, the residents would ask questions or offer comments and advice. It was a good experience to know that they were interested in the results of the work."

Summer provides students with an entry to year-round involvement. Such was the case with first-year pharmacy students John Oberlin and Katy Blankenhorn who began working in summer 2018 with Ajay Bommareddy, associate professor of pharmaceutical science. Bommareddy's research is investigating the use of alpha santalol as a treatment for prostate cancer. With four years of pharmacy school still ahead of them, the two students jumped at the chance to get a head start on research. "We are learning a lot of lab techniques in case we want to go on for a fellowship after graduation," Oberlin says.

Bommareddy says he especially enjoys working with students from the beginning of their academic careers. "It gives me great pleasure, especially working with the P1s," he states. "I like the enthusiasm I see in those students. I want to open doors for them and see them grow over the four years."

STUDENT BENEFITS

Camaraderie among students enhances the research experience. Members of Frederick's student team reminisce about working in the rain, falling in the lake while collecting samples and discovering that leeches had attached to Heffelfinger's legs. In biology professor Linda Gutierrez's lab, where she researches factors influencing tumor growth, senior biology students Isaiah Pinkerton, Jacob Baranski and Leah Thomas rib each other about their work. "I'm the organized one," Baranski says, saying he makes sure specimens are properly labeled. "Organized?" Pinkerton chortles. "You're meticulous."

Gutierrez smiles benevolently, noting that her job is to train them to work independently. "It's like when you are teaching your son or daughter to ride a bicycle: You give them a push and they have to go all the way by

Endowed Scholarships Support Student Research

External grants and institutional support from the University underwrite many aspects of the student research experience at Wilkes. Support from alumni and friends of the University provides additional funding that enables students to pursue research both on and off campus.

Recent endowed scholarships that support the research experience include:

The Carolann G. and Philip A. Besler Scholarship was established to support students conducting summer research overseen by a faculty mentor for the purpose of actively participating in a scholarly research project. To the extent possible, the intention is to financially support each student with a $3,000 summer stipend. Students from any discipline may apply but are required to obtain faculty documentation confirming their ability to support a full-time summer project in which the student will participate. Preference is given to U.S. citizens identified through the FAFSA application. The scholarship is made possible by a gift from alumni Carolann (Gusgekofski) Besler '76, who is a member of the board of trustees, and her husband, Phillip A. Besler '76.

The Bierly Fellowship supports a semester-long experience for a student and may include undergraduate research, study away or study abroad trips and internships. Awards range from $500 to $5,000. The fellowship honors George W. Bierly, who left a $1.7 million bequest to Wilkes in his estate. A Wilkes-Barre native, successful businessman and community leader, Bierly graduated from Bucknell University Junior College, the institution that became Wilkes University. He earned his bachelor's degree at MIT.

themselves," she says. Her student researchers affectionately refer to her as "Dr. G," reflecting another benefit of doing research: developing close faculty relationships.

Of greater significance are skills acquired. For example, working with Nazzal gave chemistry/premed studies major Ko a head start on her organic chemistry class. But perhaps the most important student benefit is exposure to the true nature of scientific inquiry, where answers are not pre-determined. "When we are doing research, we are traveling together on this journey to places where no one has been before," Gutierrez says. Pinkerton concurs, saying that he's learned as much from mistakes as he has from successes. "In research," he says, "we're sitting on the edge of knowledge."

Skills honed in Wilkes labs also make graduates attractive to future employers and graduate programs. "This is how we make our students more competitive in the market," Nazzal states.

Psychology faculty Ellen Newell and Jennifer Thomas have seen the proof in the students who assist them. Thomas, an associate professor and developmental psychologist, and Newell, an assistant professor and social psychologist, are studying the physiological responses of women exposed to overt and covert forms of sexism. Their students perform a variety of functions, from monitoring study subjects to painstakingly entering data in spreadsheets. "In order to get into graduate school in psychology, the really competitive ones, you have to have that kind of experience," Newell notes. If students do, it pays off: Newell and Thomas recall one student was admitted into all eight graduate experimental psychology programs to which she applied.

Boats become the laboratory for associate professor of earth and environmental science Holly Frederick '93, far left, and her students, from left, Scott Heffelfinger, Jillian Weston and Kaitlin Sutton. The three environmental engineering majors sampled water at the lake during summer research.
PHOTO BY KNOT JUST ANY DAY

PART OF THE CURRICULUM

Many academic majors require student research projects to fulfill requirements. Biology and biochemistry are just two of many requiring majors to complete senior research projects. In the engineering disciplines, year-long senior projects center around research. Psychology majors can choose to do research-based capstones. Other programs in the social sciences, such as criminology and sociology, require research papers to complete degrees.

The communication studies department has made research an integral part of its curriculum. Beginning with one of their foundation courses, "Principles of Communications," students are introduced to scholarly research through the review of journal articles. Mark Stine, professor and chair of communication studies, says, "It's important for graduates to have a working knowledge of that literature. It makes for a much more well-rounded communication studies graduate."

Seniors complete a major research project via a two-semester class, "Research Methods." For some students, the projects are examples of applied research, in which findings can help determine strategies for public relations campaigns or social media. One such example was the research study completed by Taylor Ryan '16, which studied the effect of media campaigns in influencing African-Americans to become organ donors. All communication studies students complete a written research paper and make an oral presentation to faculty. "This supports our desire to graduate students who have outstanding oral and written communications," Stine says.

In 2017, the Sidhu School of Business launched a research symposium to showcase research being done in both graduate and undergraduate courses. Jennifer Edmonds, associate dean, notes that the research culture is growing in Sidhu. A robust research culture will help to grow the school's reputation, Edmonds notes. More importantly, it will drive a culture of innovation.

"How you get to the point of innovation is through research," Edmonds says. "It's when you begin to connect the dots."

Top, Ajay Bommareddy, right, associate professor of pharmaceutical sciences, demonstrates lab techniques used in research to first-year pharmacy students Katy Blankenhorn and John Oberlin. PHOTO BY KNOT JUST ANY DAY

Bottom, junior Keira D'Agostino, left, a criminology and psychology major, adjusts equipment on senior criminology and psychology major Jess Snyder. The research will measure physiological responses to sexist behavior. PHOTO BY CURTIS SALONICK