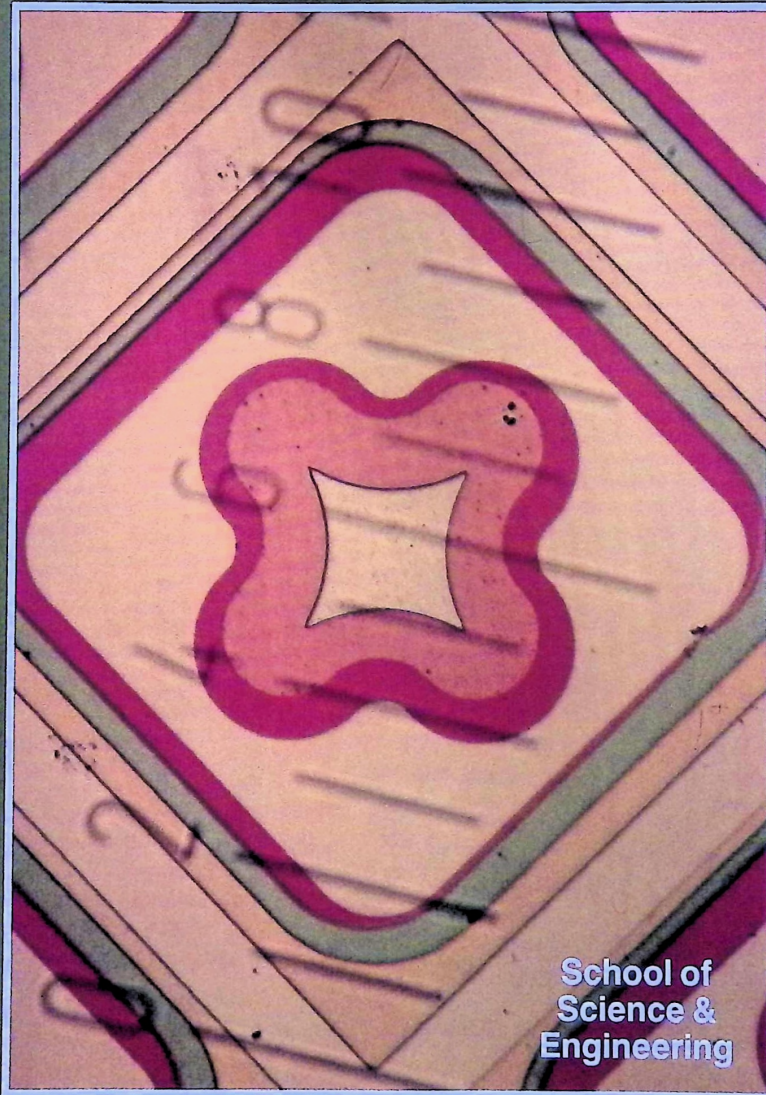


# QUARTERLY

WILKES UNIVERSITY

SPRING 1991



School of  
Science &  
Engineering

June, 1991

Dear Friends:

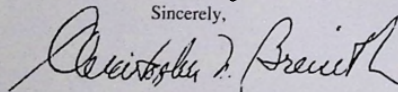
This issue of the *Quarterly* is dedicated to the sciences and engineering at Wilkes University. It highlights several of our scientist and engineering alumni who have carried their Wilkes education out into distinguished careers. They are representatives of thousands of alumni who have received a disciplined, caring, and demanding education from Wilkes faculty, experienced hands-on research opportunities, and enjoyed a broad-based liberal arts education preparing them for positions of leadership in their fields of specialization. In time we hope to have alumni directories for each of the major professional areas as we have done for physicians. In the meantime, we are using the *Quarterly* to give a quick portrait of Wilkes alumni in several fields, suggesting thereby the range of accomplishments of our graduates. By their fruits ye shall know them. We think that the alumni highlighted in this issue give witness to the quality of a Wilkes education.

This number of the *Quarterly* also describes in some detail the opportunities for students now at Wilkes in the various scientific and engineering majors, including observations from the chairs of the different departments and descriptions of the laboratory facilities at Wilkes. This issue follows two recent *Quarterly* issues that have highlighted alumni from the humanities and from business and economics.

I want to thank all those alumni who have joined, over the past months, to help us achieve our \$23 million goal for the WILKES TOMORROW campaign. We are \$500,000 short of the goal and have until December 31, 1991, to raise the full amount. Those of you who have volunteered to help solicit support from your fellow alumni are deserving of particular gratitude from those of us at Wilkes who are working hard to build long-term support from the alumni upon which Wilkes's future depends. The percentage of alumni contributing to Wilkes, while still low compared to our nearest competitors, has risen substantially during the WILKES TOMORROW campaign with the efforts of many, many people. To those of you who have not yet been approached or not yet given, I hope you will seriously consider a gift that begins a pattern of annual support of your alma mater.

I trust that all friends and alumni who read this *Quarterly* will gain a sense of pride and pleasure at the evidence that Wilkes Works through its present faculty, students, and programs as well as through its alumni.

Sincerely,



Christopher N. Breiseth



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## The Cover

The cover design is a much-magnified view of a transistor created in the Wilkes microelectronics laboratory and photographed through a microscope.

## The Quarterly

*Wilkes University Quarterly* is published by the Public Relations and Alumni offices of Wilkes University, Wilkes-Barre, PA 18766.

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## Charles A. Sorber, Ph.D.

Pre-engineering, 1959  
Dean, School of Engineering  
University of Pittsburgh

From his roots in the Wyoming Valley and his two-year pre-engineering degree from Wilkes, Dr. Charles A. Sorber has moved ahead to lead an engineering school that's nearly as big as Wilkes University in its entirety.

Yet Sorber has not lost his loyalty to Wilkes. He serves both on the University Council which advises senior administration and on the Engineering Advisory Board.

A native of Hanover Township and an outstanding athlete, Sorber chose Wilkes over other scholarship offers because other schools didn't want their football players majoring in anything difficult — like engineering.

He already knew he wanted to be an engineer. "I was fairly good at math and physics and I like to be creative and build things — make things happen. It's exciting."

After completing the two-year program here, he earned his undergraduate engineering degree from Pennsylvania State University in 1961 and joined the Army — just in time for the Berlin crisis. He spent four years in Europe, working as a public health engineer for the Army, and returned home ready to try research.

He earned his M.S. at Penn State in 1966, then rejoined the Army, doing environmental hygiene engineering. The Army also sent him to the University of Texas at Austin to complete his Ph.D. He directed a research and development lab for the Army from the time he completed his Ph.D. in 1969 until 1973 and then "began a second life in academe."

At the University of Texas at Austin, he directed a research center, did some teaching and stumbled accidentally into academic administration. From there he moved to associate dean at UT Austin.

In 1986, he became dean of the engineering school at the University of Pittsburgh.

"I've spent progressively less time in the practice of engineering as I've had more administrative responsibilities," he said. "But I still teach a course each year and lead an active research group of students and faculty." He rounds out his career doing consulting work.

His love for engineering has only grown stronger over the years. "Engineering and technology are the things that make the society we live in move. It would be a very strange society without it."

Rarely do engineers get credit for the advances in the quality of life. Instead, they get the blame if something goes wrong, he said. People talk about the engineers' failures in the space shuttle disaster or collapsing bridges. While engineers got some credit when newer buildings survived the San Francisco earthquake of 1989, Sorber said, people in general didn't praise the engineering.

"They expected the buildings to stand," he said.

That's as it should be.

It's the engineers' job "to take basic knowledge and do something with it."

Wilkes  
graduates  
in the  
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**CONTINUUM OF EXCELLENCE**

**Alan Schneider, Ph.D.**

Chemistry, 1963  
Chief Scientist, Catalyst Research Co.  
Owings Mills, Maryland

A 1963 graduate of Wilkes, Schneider had a fresh Ph.D. from Alfred University when he was hired by Catalyst Research, which is now a division of Mine Safety Appliances Co. of Pittsburgh.

They put Schneider to work on the battery problem and he solved it, sharing the patent with the company. The cardiac pacemaker battery needed several special qualities, he explained. While a car battery will wear out in just a few months unless it's recharged and the flashlight will last only a year or so, the pacemaker battery needed a minimum life expectancy of 10 years.

He developed the tiny battery that stores a great deal of energy and releases it slowly over a long time span without consuming itself. After 10 years, the battery still operates at 90 per cent or more of its original power, he said.

His invention has taken him to cardiologists' conventions around the world where he has explained its use and features. And he has met the world's first cardiac pacemaker user, who is still living.

Other patents involve sensors to detect toxic gases in the work environment and to monitor oxygen levels in a patient's blood while under anesthesia.

The toxic gas monitor detects carbon dioxide, chlorine and hydrogen sulfide before they reach fatal levels. The oxygen monitoring system uses a finger clip that measures oxygen by shining a light through the finger.

Wilkes prepared him to be a scientist, Schneider said. A Wilkes-Barre native, he chose Wilkes because it was close and offered the financial aid he needed. He knew he wanted to be a scientist when he arrived, but had no specific plans in mind. Choosing chemistry, he found a mentor in Dr. Ralph Rozelle and found himself "trained as a professional — ready for either industry or graduate school."

Schneider has three children. Christopher, 24, Eric, 22 and Linda, 18.

From the battery that powers the cardiac pacemaker to devices to measure carbon dioxide in the work environment, Alan Schneider's creative talents have coupled with his chemistry competence to improve the health and safety of people on the job and off.

**George C. Harrison, Ph.D.**

Mathematics, 1969  
Professor of Computer Science  
University of Norfolk, Virginia

Virginia. "They gave me an education — so much more than just technical training."

He came to Wilkes as a mathematics major, but "Richard Sours got me interested in being a research mathematician and all the other wonderful professors convinced me that this was a career I could enjoy."

A native of Honesdale, Harrison had sampled the Wilkes campus when he tried out for district band. He returned to take the tests required to receive Veteran's Administration educational funds. By the time he was ready to choose a college, Wilkes topped his list — and it had the strong mathematics department he wanted.

Following in Sours' footsteps, he went directly to a Ph.D. program at the University of Virginia, completed his doctorate in 1973 and began teaching at Norfolk State that year.

In 1984, Norfolk State, a predominantly black school, had the opportunity to apply for grants to offer computer science courses. Harrison volunteered to return to graduate school and earned a master's in computer science at Old Dominion University. Since that time he has been a professor of computer science at Norfolk.

"I had stopped doing math research because it was so far away from what we were teaching. But in computer science we have undergraduates doing research."

Harrison has won grants from the National Science Foundation and the U.S. Army and is currently doing contract work for McDonnell Douglas in the field of software engineering and neural networks that simulate learning and recall.

Enjoying his reminiscences about Wilkes, Harrison mentioned great professors including Boyd Earl, Bing Wong, Joe Salsburg, Jim DeCosmo and Tom Richards — so dedicated that he taught Harrison's class rather than go to the hospital after being hit by a car. And Millie Gittins in the bookstore "was a mother to everybody."

Active in Cue and Curtain and Interdormitory Council, Harrison also recalled how the living areas in Pickering got their names — Roosevelt for a student who did Teddy Roosevelt impersonations and Grissom for the astronaut killed during their school years.

At Wilkes, the personalities made so much difference, he said. Harrison and his wife, Kay, who is a Spanish teacher, have two sons, George Alexander, 14, and Nicholas, 11.

"I think I'm a good teacher, and I learned that at Wilkes," said Dr. George C. Harrison, a professor of computer science at the University of Norfolk in

**John Macur, Ph.D.**

Physics, Bachelor's 1969, Master's 1971  
Research Group Leader  
Allied-Signal, Morristown, New Jersey

Problem solving for corporate and customer questions and characterization of products bring daily challenges for John Macur, who leads the microscopy group for Allied-Signal's corporate research laboratory.

"If the company or a customer has problems with our products, we have to solve them," said Macur. The customer might complain of difficulties using nylon film from Allied; Macur's lab responds by identifying the contaminant and helping the customer learn where it was introduced into the product. "Often we get a finished product and it may not be our material that's causing the problem at all."

Allied, based in Morristown, New Jersey, has three major units — an aerospace unit, an automotive sector and an engineered materials sector, with corporate laboratories serving all three. His expertise includes optical, scanning electron and transmission electron microscopy.

With Macur's assistance, Wilkes now offers scanning and transmission electron microscopy classes and experience to undergraduates — Allied donated a scanning electron microscope to the university — but Macur didn't get interested in microscopy until graduate school. With a bachelor's and master's degree in physics, he turned to materials science for his Ph.D. at Syracuse in 1979. And with his study of materials science, he began heavy use of transmission electron microscopy.

He joined Allied as a scientist in 1975, using their scanning electron microscopes. The change from graduate school to Allied opened a wide new horizon. As a graduate student, he had worked primarily with thin film metal. At Allied, he works with metals, ceramics, polymers and other materials. "I get to know many different kinds of samples. It's a very diverse kind of field."

Although it's not a research job, Macur's problem solving skills involve him in many research projects. If one sector of the company is developing a ceramic composition, Macur's lab would help by characterizing the microstructure allowing the research team to refine it for their project. "We try to tell them what they've made," he said.

Macur said he prefers his problem solving role to straight research. "In basic research, you have very similar components from day to day. I work with everything the company makes." One day may be devoted to an investigation of why a brake component didn't work properly, the next to why a food wrap leaked and the following working with metallic glass.

The variety itself, plus his leadership role in the group, "allows me to see more of problems as a whole, rather than one specific point."

His wife, Diane Wilson Macur, is a 1970 Wilkes graduate and is now managing a townhome development sales office in New Jersey.

**Ralston S. Robertson, Ph.D.**

Two-year Engineering program, 1970  
Section Head, Millimeter-Wave Subsystems  
Hughes Aircraft Co., Canoga Park, California

Still believing that Hughes Aircraft Company made airplanes when he joined the company in 1972, Dr. Ralston Robertson was quick to learn that Hughes specializes in advanced electronics.

While Hughes underwrote his master's program at the University of California as a Hughes Master's Fellow, he worked throughout the company.

After earning his master's he was assigned to the missile systems group, developing power amplifiers for the Phoenix missile. He was again named a Hughes Fellow and earned his Ph.D. in 1984 from the University of California. When Hughes created a millimeter wave subsystem section within the radar lab of the Hughes Missile Systems Group, Robertson became its leader. He is an internal research and development program manager for an advanced millimeter-wave radar.

Robertson has co-authored papers in the field of microwave and millimeter-wave oscillators, transmitters, antennas, radar transceiver subsystems and millimeter-wave radar systems.

A native of Plains, Robertson came to Wilkes from Wyoming Seminary when Wilkes had only a two-year pre-engineering program. Active on campus, he served as president of the Engineering club, received the chemistry award and served on the student government.

After leaving Wilkes, Robertson completed his undergraduate degree in electrical engineering at Lafayette College in Easton where he graduated magna cum laude in 1972. He is a senior member of the I.E.E.E., and a member of Eta Kappa Nu electrical engineering honor society, Tau Beta Pi engineering honor society and Phi Beta Kappa.

He holds one patent with a second pending.

Robertson serves on the Wilkes Engineering Advisory Board because "it's a good engineering school" and "I want to give something back." He especially praised the Wilkes electromagnetics laboratory facilities.

CONTINUUM OF EXCELLENCE

CONTINUUM OF EXCELLENCE

**Emilio Marianelli**

Engineering, 1973  
Senior Engineering Manager  
Digital Equipment Corp.  
Salem, New Hampshire

An Old Forge native, Marianelli chose Wilkes because of the attractive student-teacher ratio and was impressed by the quality teachers and their rapport with students.

One of Wilkes's first four-year engineering graduates and a flood era student, Marianelli jokes that his engineering degree was teamed with one "in sandbagging and flood clean up," but adds that being part of the change to a four-year engineering program gave students the opportunity to help set up laboratories. A valuable experience, Marianelli said he "wouldn't trade it for anything."

Upon graduation, Marianelli became an engineer with NCR Corporation. During his eight years there, Marianelli did graduate work in engineering at Ohio University and earned an MBA degree from Wheeling College in West Virginia.

His contributions at NCR in the field of systems engineering were "very visible," he said, and he was recruited away by Digital Equipment Corporation.

Now supervising 60 people on two continents (in New Hampshire and in Valbonne, France), Marianelli said he does more managing than engineering. But he reached his current position because of his work in computer system integration and performance characterization. He is currently working on integrating and characterizing complex networks that link various technologies, such as Ethernet, token ring, and fiber optics, keeping all optimized and ensuring that these new technologies don't degrade the performance of the existing network. His group is also involved in a new area of network performance modeling called distributed systems capacity planning, which deals with predicting the behavior of networks involving thousands of computers.

Recognizing the value of his Wilkes background, Marianelli has worked in several ways to help his alma mater. He is a member of the Engineering Steering Committee, he has spoken to engineering symposia on campus and he was instrumental in getting Digital Equipment Corporation to make a significant donation of computer equipment to Wilkes.

"I'm still very proud of that school," he said, adding that he would like to see an increased computer focus and would like to create a co-op experience for Wilkes students and a research partnership between Wilkes and Digital. "Wilkes generates high quality students."

Marianelli and his wife, Tonnie, have three children, Matthew, 16, who has just been named a National Merit Semi-Finalist; Brian, 12, and Mark, 7. They live in Derry, New Hampshire.

"Networking and communications are the emerging technologies of the 90s — the cutting edge in the computer industry," said Emilio Marianelli.

That's where you'll find him. "Integrating the business environment through network based distributed computing — it's an exciting place to be," Marianelli said.

From his graduate schools days, through post-doctoral fellowships at the National Institutes of Health and Harvard, to a research post at NIH and fellow status at Monsanto, Hollis has been part of research groups "that have made fundamental discoveries that advanced science," he said.

**Steven Forst, Ph.D.**

Biology, 1974  
Assistant Professor of Biology  
University of Wisconsin, Milwaukee

"Figuring out how nature works" is more than a career for Dr. Steven Forst. It's a passion.

"I get excited by understanding the molecular mechanism. If I can provide a greater understanding of how cells respond and contribute to my field, that would be great."

Leaving Wilkes for an M.S. program at Rutgers University and a Ph.D. at New York University, Forst did post-doctoral research at the University of Medicine and Dentistry of New Jersey, where he developed his abiding interest in molecular biology, especially the process by which cells communicate with their environment.

With a strong background in protein chemistry, phospholipid metabolism and molecular biology, Forst's research interests are focused on achieving a better understanding of the molecular mechanism of signal transduction in cells and the environmental regulation of gene expression.

Using the bacterium *Escherichia coli* as a model system, he studies the adaptation of organisms to different environments by the differential regulation of specific genes.

"All cells, even bacteria, have to adjust to changes in nutrition, temperature, light and oxygen," he said. The essential element is the process that turns genes on

**Gregory Hollis, Ph.D.**

Biology, 1974  
Research Group Leader  
Merck, Sharp & Dohme, Rahway, New Jersey

Gregory Hollis, who joined Merck, Sharp & Dohme in April, has made a career of "looking for cures for human diseases."

From his graduate schools days, through post-doctoral fellowships at the National Institutes of Health and Harvard, to a research post at NIH and fellow status at Monsanto, Hollis has been part of research groups "that have made fundamental discoveries that advanced science," he said.

They have developed "insights about how the human body responds to pathogens and about fundamental mechanisms of cancer."

Graduating from Wilkes summa cum laude in 1974, Hollis moved into a Ph.D. program in biochemistry at Johns Hopkins University, studying the enzymes of DNA repair. Earning his Ph.D. in 1980, he began his post-doctoral fellowship at the National Institutes of Health, studying immunoglobulin gene structure and expression; then moved to Harvard University where he pursued the relation of chromosomal translocation to malignancy.

From there, he earned the opportunity to start his own lab at NIH's National Cancer Institute, where he continued his studies of chromosomal abnormalities.

He joined Monsanto as a senior fellow in 1987, working to create transgenic mice to model human diseases. By working with the DNA, he is able to change the genome of the mouse so it more closely resembles a human, allowing a better test for the therapeutic value of pharmaceutical agents in treating human diseases.

At Merck, Sharp & Dohme, he will direct a research group in cellular and molecular biology.

Hollis believes Wilkes has been an essential part of his career. The liberal arts background gave him the skills to interact well with colleagues and the small size gave him the opportunities to be involved. Moreover, the close association with faculty in the sciences helped him learn to think rather than simply to memorize facts.

The winner of Wilkes's Distinguished Young Alumnus Award in 1988, he has recently been named to the advisory board for the School of Science and Engineering.

Hollis and his wife, Jeannine, also a molecular geneticist, have one son, Matthew, 15 months.

**Steven Forst, Ph.D.**

and off, causing the DNA to adjust to the new situation. "It's a basic process, both in normal cells and in a disease state," he said. Cancer, for instance, is simply turning genes on in an abnormal way.

His current research has earned him two prestigious grants — the \$175,000 Milwaukee Foundation Shaw Scientist Award and a \$500,000 grant from the National Institutes of Health.

At Wilkes, Forst worked as a resident assistant and as a volunteer taking troubled youths for outdoor experiences during his undergraduate years.

His Wilkes training in how to do research has proved invaluable, he said. "Independent research, where I identified the problem and designed the study — the opportunity to do independent study with very good support from a multitude of professors — was a good foundation." He hopes that his teaching of undergraduate microbiology and graduate specialty courses will also help "provide students with an understanding of the excitement of research."

Recalling his own undergraduate days, Forst especially appreciated the role of Dr. Lester Turoczi for his biology studies and of Dr. Charlotte Lord for helping appreciate literature and life.

Forst and his wife, Susan, also a microbiology professor, have two children, Emily, 6, and Daniel, 4.

CONTINUUM OF EXCELLENCE

CONTINUUM OF EXCELLENCE

## Tony DeVita, Jr.

Mathematics, 1976  
Project Leader, On-Line Transaction Processing Systems  
Data General, Research Triangle Park, North Carolina

DeVita doesn't hand out the cash. He doesn't write the tickets. And he doesn't battle in the trading pits of Manhattan. He writes the computer system software that allows those transactions to be handled by computer. "Our job is to allow data access quickly," DeVita said. Basic systems are already in place in many industries, he said, but computer hardware is constantly faster and cheaper, and "people want to continue making recovery of information faster and cheaper."

For instance, if a brokerage firm allows 700 people to log on and wants to increase that to 4,000 people, it needs a change in the system software. Simply adding more terminals would make the process unbearably slow and perhaps interrupt the reliability of data. "This is very sophisticated software with 80,000 to 100,000 lines of code spread over 700 to 800 distinct parts," he said.

Even as DeVita completes his current project, he is moving into a "4GL" project — computer jargon for "fourth generation language" in which the programmer uses an "almost English-like language" instead of the old COBOL, FORTRAN and BASIC languages computer experts once had to memorize.

An Old Forge resident while in high school, DeVita chose to come here because his high school chemistry teacher, Armando Salkowski '68, regarded the school highly. "Much influenced by Richard Sourin," DeVita majored in math.

"Computer science was in its infancy then. It was a purchased environment on a Honeywell machine and interfacing with Lehigh University." So he stuck with pure mathematics.

After graduating in 1976, he joined Bell Labs, earning his master's degree at Stevens Institute while employed at Bell. In 1978 he joined IBM. During his 30 years there, he also earned his M.S. in engineering at the University of Pennsylvania. He joined Data General in 1988.

Looking back, DeVita said that his work doesn't involve a direct application of the mathematics he learned at Wilkes, but "the logic and ability to solve problems is directly related."

If you ever needed cash on the weekend and used your MAC card. If you ordered an airline ticket by phone. If you ordered a stock transaction any place but Wall Street. Then you have benefitted from the technology that Tony DeVita Jr. spends his career improving.

## Bridget James Hofman

Earth & Environmental Science, 1977  
Director, Hazardous Sites Clean-Up Program  
Pennsylvania Department of  
Environmental Resources, Harrisburg

As director of the Hazardous Sites Clean-Up Program, Bridget Hofman supervises "the safety net for environmental contamination problems."

Today, anyone disposing of hazardous wastes must go through a careful permit process and the actual disposal is carefully scrutinized by experts.

Not long ago, however, "they worried more about rats than about trichloroethylene in your drinking water." That has left behind a series of environmental problems that pique the fears and endanger the health of people living throughout the Commonwealth and across the world.

Working on site cleanup is satisfying because it helps protect public health, Hofman said. "I have a direct impact on the water and on protecting kids from PCBs that have washed into their backyards."

She has also worked in the prevention aspect, editing the Hazardous Waste Facilities Plan in 1985 and 1986. The plan, which outlines how much waste to expect, what it would be and how to handle it, was a first for Pennsylvania and the prototype for many other states. Having the plan hasn't solved the problems. Though most people realize the need for disposal sites, the DER faces what she calls "a NIMBY problem" — the common response that it's a good idea but "not in my backyard."

One of the first graduates to enter the job market with a degree in Earth & Environmental Science, Hofman said she spent the first years of her career trying to convince people that you don't have to be an engineer to deal with environmental problems. On the contrary, her wide-ranging background in the sciences made it possible to talk with a hydrogeologist one day and an environmental chemist the next, and not be lost with either.

Most valuable in her Wilkes education, however, was the style of Dr. Brian Redmond's teaching, she said. Instead of requiring students to memorize long lists of facts, "they teach you to solve problems — to use technical information and common sense to determine what's feasible."

The science of E&ES was real rather than laboratory bound, she said. "You could go out in the field, sample water and decide whether you would want to drink it."

Her husband, Richard, also a 1977 graduate in E&ES, owns his own consulting firm specializing in industrial hygiene, safety and OSHA compliance.

CONTINUUM OF EXCELLENCE

## Lynn Arlauskas-Dekleva

Biology, 1981; Medical Technology, 1984  
Bioengineering Division, E.I. DuPont de Nemours & Co.  
Wilmington, Delaware

she has frequently used her understanding of cell lines, of microbiology and of how to work with engineers.

"Engineers know calculations. I know cell lines." Together they could solve problems that neither could master as well alone. Now she is as comfortable with the engineering skills she has learned on the job as the biology and medical technology she learned here.

## Capt. Thomas R. Matiska

Electrical Engineering, 1980; ROTC  
Navigator, United States Air Force  
Pope Air Force Base, North Carolina

Hauling tents, bombs, water, even the U.S. Mail, may not sound like an engineering job. But the electrical engineering degree, coupled with Air Force ROTC at Wilkes, led Thomas Matiska to pilot training.

The life he refers to as "the slow lane" — flying cargo planes instead of jets — suits him fine, both in war time and in peace.

All he wanted was to fly.

A local resident, he chose Wilkes because he wanted a good engineering school and ROTC. His hopes for flying were dashed early on when a bad eye test eliminated him from consideration for training, but the engineering was still fascinating, so he continued.

Joining the Air Force as a navigator, he served as an electronic warfare officer on the F4G Wild Weasel and found his background in radar and electrical engineering to be a great asset. "It's a natural progression from electrical engineering to electronic warfare," he said. Engineering also helps pilots understand an aircraft and its systems, he added.

After serving six years, he passed the eye test and joined pilot training.

After early years "in the back seat of fighters," he now spends his time in the front seat of cargo planes.

During the Gulf War, he hauled cargo from one location to another throughout the theater. His flying has taken him through all of Western Europe, to Turkey and the Middle East, to Central America and to Korea, Japan and the Philippines. "We get off the beaten path — not just to Frankfurt International," he quipped, though he added that much of Saudi Arabia and Iraq were just "kismet with air strips."

He loves to travel, but when he has time off, "I don't want to take an airplane." So he rides a motorcycle. In the 30 days leave between pilot training and his next assignment, he rode from Del Rio, Texas, to Arkansas — by way of Fairbanks, Alaska.

Lynn Dekleva loves her work because of the variety. "I'm brought in when there's a problem. I work a year or so to address the problem and then go on to something else."

Hired by DuPont for her combined skills in biology and medical technology,

she has frequently used her understanding of cell lines, of microbiology and of how to work with engineers.

For several years she worked on biomedical projects, developing cultures of white cells and transforming them to create continuous blood lines. The concept was used in two experimental cellular therapies for cancer patients. In one, white blood cells were extracted from the patient, then activated to become killer cells and returned to the patient to fight the cancer. Tumor Infiltrating Lymphocytes, another experimental therapy developed at that National Institutes of Health, involves taking a portion of the tumor itself and activating the cells to make them killer cells.

A specialist in affinity separation or developing specific cells, Dekleva was heavily involved in both projects.

Now DuPont has dropped its biomedical programs into a joint operation with Merck, Sharp and Doehne. Dekleva opted to stay with DuPont, so she has moved on to environmental bioengineering. Still working with affinity separations, her efforts are directed at waste reduction and bioremediation of waste problems.

In addition to her full-time work, she is studying full-time toward a Ph.D. DuPont's encouragement of her education helped her decide to stay with that firm rather than following her work to Merck, Sharp and Doehne, she said.

Dekleva credits her Wilkes experience with getting her career off on the right foot. While many recent college graduates merely copy their professors' advice from a strong, smaller school has the opportunity to work with many professors and is not "a clone of one professor." A Wilkes student, for example, is ready to get to work. Dekleva said she was able to do and design experiments within a week of joining DuPont.

Dekleva and her husband, Mark, who is a salesman for Great Lakes Chemical Corp., live in Wilmington.

CONTINUUM OF EXCELLENCE

## Sue Montgomery

Electrical Engineering, 1983  
Acting senior nuclear maintenance engineer  
Pennsylvania Power & Light, Allentown

But her Vo-Tech teacher contacted Dr. Usaid Nejjib, said he had a very talented student and asked for advice. Montgomery was introduced to Wilkes through the ACT 101 program. Aside from having to take an extra semester of college-level algebra and calculus to replace her pre-college level credits, she sailed through Wilkes, graduating with a degree in electrical engineering.

A summer graduate, she joined EPRI even before she received her diploma. Moving through several departments before joining her current one, she is now a specialist in nuclear maintenance. She worked at the Berwick nuclear power plant until about a year ago when she was promoted and transferred to the company's general offices in Allentown.

A specialist in "predictive maintenance," her work involves learning how all the equipment operates and whether the monitors that check it are working properly; then determining whether the equipment itself is working within acceptable parameters and finally determining the optimum time for maintenance so that equipment does not break.

As acting senior engineer, she supervises a group of engineers and interacts both within her company and with engineers throughout the industry. "You have to be really outgoing to like this work," she said. "If you like to spend your time verifying formulas, then this isn't for you."

In addition to her EPRI work, she is a technical adviser to EPRI. Married to another electrical engineer, she is expecting their first child imminently.

Design and drafting were the future for Sue Montgomery in her high school days at the Wilkes-Barre Area Vo-Tech. But an alert teacher noticed her quality work and asked her why she didn't plan on college.

Funds were limited and nobody in her family knew how to get to college without funds.

Funds were limited and nobody in her family knew how to get to college without funds.

## Eric Johnson, Ph.D.

Earth & Environmental Science, 1983  
Research Associate in Geology, Princeton University  
Assistant Professor of Geology, Central Michigan University  
Mount Pleasant, Michigan

Moving in earth and environmental sciences "preserved me from becoming too narrow before finishing graduate school," said Dr. Eric Johnson.

A post-doctoral research associate at Princeton University, Johnson will become assistant professor of geology at Central Michigan University this fall.

When Eric Johnson entered Wilkes in 1979, he was a "starry-eyed music major" planning on a career as a pinch percussionist. A first semester class in singing changed all that. By November of his freshman year, Johnson was certain he'd never make the grade as a musician and he didn't care, because he was fascinated by Dr. Michael Case's course in oceanography.

He has never turned back.

"Earth & environmental science was great for me," Johnson said. "It covers so much ground. The environmental part really got to me because of the early 70's attitude I had and still have." He recalls with great pleasure his involvement in environmental issues, especially carrying petitions for the Clean Air Act.

After graduation, Johnson completed master's and Ph.D. degrees in geology at the State University of New York at Binghamton, earning his Ph.D. in 1990.

Involved since graduate school in research on how fluids move through the earth's deep crust, Johnson has been a post-doctoral research associate with Lou Hollister at Princeton, studying natural rocks from Sardinia. In Michigan, he will team up with a Swiss geologist, studying fluid flow by observing rocks from the Swiss Alps. Studies of fluid flow in the deep crust — 30 to 40 kilometers beneath the Earth's surface — are generally conducted in Italy and Switzerland where rocks from that level have been thrust to the surface relatively recently, Johnson explained. Although the fluid is gone now, it leaves traces that geologists can observe to better understand conditions that are otherwise inaccessible for scientific observation.

In his new post, as assistant professor of geology at Central Michigan University, Mount Pleasant, Johnson will also be involved in a project with all geology faculty in the Michigan university system, trying to aid the state's ailing mineral industry.

Suzanna Bernd is not your typical computer science major. She is not your typical music major either. Frankly, Suzanna Bernd is not your typical anything.

She has a dual major in music performance and computer science, but she has further refined her interests and made both degrees notes in the chord of her career as personnel coordinator for the Philadelphia Orchestra.

A French horn player, Bernd completed her music performance degree at Wilkes, playing in the wind ensemble, the brass quintet and singing in Cap and Bell Singers. By her sophomore year, however, she had already recognized in herself that she did not "like the solitude time of practicing. I like to be with people."

## Thomas J. Hughes

Bachelor's, Materials Engineering, 1988  
Master's, Electrical Engineering, 1990  
Process engineer, Gentex Optics, Inc.  
Carbondale, Pennsylvania

From the transparent coating on a military helmet visor that shields a pilot's eyes from laser radiation to the mirrored look on the drugstore sunglasses, Thomas J. Hughes uses his expertise with thin film to get the job done.

As a process engineer with Gentex Optics, Hughes supervises production and is involved in research on thin film applications in a variety of products.

Heavily involved in the safety market, Gentex also produces sunware, prescription lenses and visors, Hughes said. His work includes the application of thin film for both cosmetic purposes — such as the sunglasses — and for protective purposes such as abrasion resistance and radiation protection.

All the products are made from polycarbonate, he said.

A native of Nanticoke, Hughes came to Wilkes because of its strong engineering program. He was fascinated by the materials engineering work he tried with Dr. Ali Razavi. As an undergraduate he was involved in Razavi's Ben Franklin Partnership projects with regional business and in his Naval Air Development projects. Although his master's degree is in electrical engineering, his thesis involved high temperature superconducting thin film, and he regards himself as a materials engineer.

Although his work is now involved with optical applications of thin film, rather than the high temperature superconductors he specialized in while in school, he said the processes are similar and his Wilkes background is directly related to his present work.

Hughes enjoys outdoor activities, especially swimming and skiing.

## Suzanna Bernd

Computer Science & Music, 1987  
Personnel Coordinator  
The Philadelphia Orchestra

From midway through college she was aiming for a career in art management. "I think it's very important that art organizations have professional managers — people with a good balance of business sense and the arts," she said.

Now using her French horn for personal pleasure and her computer as a tool in her work, she has also earned an M.B.A. and an M.A. in arts administration, both in 1989 from Southern Methodist University, in Dallas, Texas.

With these degrees in hand, she landed just the job she wanted.

As personnel coordinator for one of the "big five" orchestras in the United States, she hires the musicians selected by the music director, runs auditions and maintains the benefits and payroll for 175 musicians. She attends all concerts and makes sure rehearsals and performances get started on time.

Being a musician is an advantage for her in working with musicians, she said. "They're looking for understanding of what they're doing. They're extremely sensitive people or they wouldn't have reached this level. It's important to understand what they're going through in preparing for a performance."

Reflecting on Wilkes, Bernd said, "I was prepared well. I always appreciated the high level of teaching. The level of professionalism far exceeds the reputation — especially in computer science. The faculty's attention to the individual, as well as their ability to teach, assisted me greatly. It's always very nice to be a person, and not a number."

CONTINUUM OF EXCELLENCE

CONTINUUM OF EXCELLENCE

## Laura Mlinar '91

Student researcher, Lawrence Radiation Laboratory  
Berkeley, California  
Medical student, Hershey, Pennsylvania

Mlinar earned the job in the laboratory's cell and molecular biology division after responding to an announcement on Wilkes's chemistry bulletin board. "I was thrilled when the laboratory called and told me I was accepted," she said. Leaving Wilkes "comfortable" and "confident" about the challenging work, she credited Wilkes Professor Emeritus James Bohning and chemistry Professor Owen Faust with giving her the confidence to try. "Both men have been a big help. Thanks to them I know I'm prepared."

Laura Mlinar is no stranger to special research programs. Last summer she did organic chemistry research while attending the Bucknell University Research Experience for Undergraduates.

Mlinar was right to be confident. At the close of her semester at the Lawrence labs, she was offered a permanent job at the facility.

But she chose to follow her previous dreams instead. Before she left for California she had already been accepted at four medical schools and will begin studies this fall at the Pennsylvania State University Medical School at Hershey. She plans to become a physician but to continue her cancer research work as well.

The Lawrence Berkeley Laboratory (LBL) is a multiprogram national laboratory managed by the University of California for the U.S. Department of Energy (DOE). The oldest of the nine national laboratories, LBL has more than 3,000 employees. Its total budget of \$170 million supports a wide range of research activities in fields ranging from astrophysics to energy conservation.

The Laboratory's role is to serve the nation and its scientific and educational communities through energy-related research performed in its unique facilities.

Current programs encompass all the natural sciences, as well as engineering, mathematics, and computer sciences. Basic studies of the nature of the atom and its cell, research on new treatment for cancer patients, and the development of advanced materials, instruments, facilities, and new energy sources are just a few examples of LBL research.

Laura Mlinar's last semester at Wilkes was not at Wilkes at all. The 1991 graduate was one of a handful of senior science majors selected from hundreds of thousands of applicants to work in the Lawrence Berkeley Laboratory's Science and Engineering Research Semester program in California.

## Kevin Tronkowski '91

Electrical engineering  
General Electric, Johnson City, New York

Kevin Tronkowski knew exactly what he wanted to do after graduation. The electrical engineering major wanted to be part of the highly competitive General Electric Edison Engineering program. His dream has come true.

Tronkowski began working in the G-E Aircraft Control Systems Department at the Johnson City, New York, plant in June. He is helping to design and manufacture flight and engine control systems for the military and engine contractors.

While many college graduates send out hundreds of resumes looking for that first job, Kevin sent out only a few and worked hard to land the job with G-E. His biggest task was to convince the people at G-E he was the type of person that best fits the Edison Program, which was developed to teach engineering leadership and technical skills to the leaders of tomorrow.

Tronkowski has been hooked on G-E ever since last summer, when he worked there as an intern.

"The more I learned, the better I liked it. They take you and nurture you and make you feel a part of the company. The Edison Program seemed like the best program for me," said Tronkowski.

The rest wasn't easy. It took several months, two interviews and constantly keeping in touch with the people at G-E before Tronkowski was notified he was selected.

"I was pleased and relieved when I finally received the letter of notification. I didn't plan many other options. I shot for the best and I landed it."

The competition was tough, but Tronkowski said, "I wasn't intimidated at all. I discovered Wilkes had prepared me as well or better than anyone else I met," said Tronkowski.

Tronkowski hasn't spent all of his time at Wilkes studying. He was also the starting goalkeeper for the University soccer team. Named to the Middle Atlantic Conference all conference team in 1990, he was an Adidas Scholar-Athlete First Team Soccer All-American in 1989.

# The School of Science & Engineering

Calculus is not an end in itself. Neither is histology or English or microelectronics or quantum mechanics.

Every course taken by students in science and engineering at Wilkes University is part of the integrated curriculum which helps mold undergraduates into scientists and engineers of broad vision.

The school's success rate is admirable with 500 physicians and 350 Ph.D.'s among its alumni. "We encourage women as much as possible both in our student body and in our faculty and staff," added Dr. Umid Nejb, dean of the School of Science and Engineering.

Additionally, Wilkes specializes in undergraduate education, its facilities and laboratories are first rate. 56 of the 58 Science & Engineering faculty members hold Ph.D. degrees, and the moderate cost makes Wilkes an exceptional value, Nejb said.

Although Wilkes offers graduate degrees, they are founded on the high quality undergraduate programs, Nejb said. Faculty members are allowed to spend no more than half their time teaching graduate courses.

"We frontload our courses," Nejb added. "We try to have our best faculty teach the foundation courses. Moreover, the faculty has the full responsibility not only for lectures but also for labs and recitation sections."

Virtually all faculty members are involved in some research.

"Research and good teaching can't be separated," said Nejb. "It's the norm for SSE faculty to do both."

"Science and technology change so fast that if you are to be credible in the classroom you have to keep up."

The Wilkes faculty does so, he said, producing work that any institution would be proud of.

High quality research is important because it helps faculty hold the students' attention, Nejb said. "You can't be flamboyant teaching science and

engineering. You have to put equations on the board and try to get the students' attention. If the students know that IBM or NASA is willing to take the faculty member's advice, then the student will pay attention and listen."

Capable students led by a high-quality faculty produce "good engineering" — and good engineering is the degree of elegance associated with creativity solving problems.

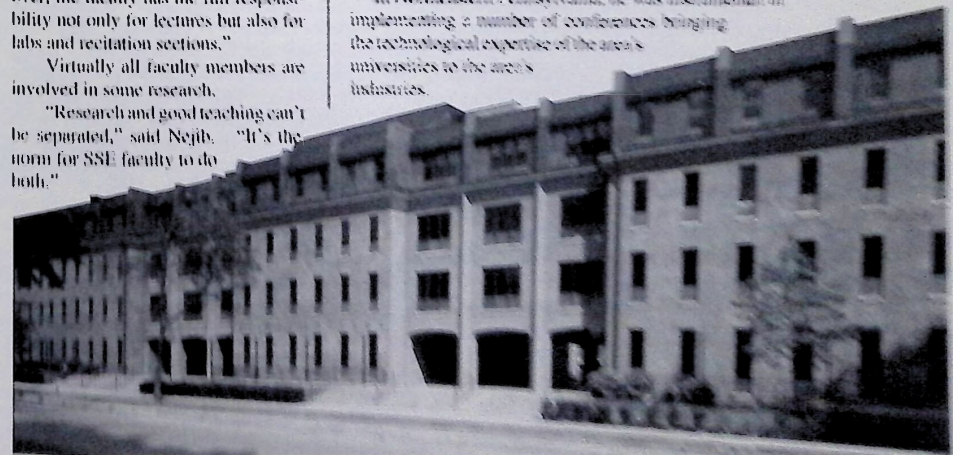
Dr. Umid R. Nejb, dean of the School of Science and Engineering, earned his Ph.D. in electrical engineering in 1966 at Carnegie-Mellon University. He has taught at the University of Baghdad and Carnegie-Mellon in addition to Wilkes. His professional experience includes work in the areas of energy conversion, microwaves and antenna systems, computer integrated manufacturing and digital systems for organizations as diverse as the Central Communication Agency and the Westinghouse Corporation.



Recognized internationally for his work, he was a selected participant in the IEEE Outstanding International Lecture Tour and the Specialist Lecture Series. He has published and presented more than 50 professional papers and supervised more than 50 funded projects totaling \$5 million.

He was selected to serve on the national blue ribbon committee on the "Liberal Outcomes of Professional Studies," was nominated for the U.S. presidential medal for engineering and technology and serves as an adviser to the Assistant to the President of the United States for Science and Technology.

In Northeastern Pennsylvania, he was instrumental in implementing a number of conferences bringing the technological expertise of the area's universities to the needs industries.



## CONTINUUM OF EXCELLENCE

## the disciplines

### Biology: Lester Turocz, Ph.D., Chair

Philosophers do not solely own the domain of "knowing oneself," said Dr. Lester Turocz. "Biologists cherish the idea of knowing oneself as a finely honed product of biologic evolution. In the attempt to know oneself biologically, we try to also know the context — to concern ourselves with the living world that surrounds us."

"The biological basis of behavior and of intelligence, as well as the normal anatomy and physiology, have become fascinating areas of inquiry to the student of biology. The most recent major hallmark of progress in the broad field of biology was the discovery of molecular biology and molecular genetics."

"The insight that biologists have gained in learning the workings of the cell, especially the nucleus where the genes are stored, has become the springboard for the next generation of molecular biologists, who are attempting to study the brain — the last big frontier in understanding the animal organism."

Even as biology becomes more specialized and as individual biologists focus on ever more narrow fields, the biologist needs a broad context for study, Turocz said. "It allows them to have a fine appreciation of the interconnectedness of life."

Wilkes has never lost sight of that, Turocz said. Although the curriculum is continually revised to stay current, "we have a strong emphasis on showing the relationships of all living things to their environment. We take pride in teaching our students to understand natural history — the organism in its habitat, anatomical and genetic adaptations — the information needed by the Renaissance person."

"There's more to biology than molecules and cells — everything is interrelated from the subcellular level to the biosphere. Although many institutions have abandoned that broader view of the living world, we believe in a continuum of intellectual inquisitiveness. If you can understand the organism and its habitat, you have a better idea of what's inside the cell."

About 75 percent of the university's biology majors are preparing for medical school, Turocz said, but an increasing number have chosen graduate school on a research and academic career track.

Even in the traditionally competitive pre-medical tracks, students exhibit wonderful camaraderie, a trait the faculty consciously builds by helping all biology students learn to regard themselves as junior scientists.

The camaraderie and the avoidance of early specialization helps students (the deeper, the more intellectually inquisitive and more curious to discover the secrets of Mother Nature.)

### Aerospace Studies

#### Air Force Reserve Officer Training Corps

##### Lt. Col. A. Roger Matson, Chair

"There's a whole lot more to the Air Force than putting on a flight suit and going out dropping bombs," said Lt. Col. A. Roger Matson. "We are preparing students for the staff side as well as the operational side of the United States Air Force."

The concentration on leadership, speaking and writing skills, time management and attention to detail which are part of ROTC courses are valuable for every student who participates, Matson said. "Even those who leave after two years are better prepared than their civilian counterparts," he said.

Students continue to be attracted to ROTC for the scholarship money, Matson said, as well as the promise of a job after graduation.

"It also offers good prospects for technically oriented people — computer specialists and engineers, especially — and nurses," he said. "There is an opportunity to work big jobs in military research and development that beginners couldn't get in the first five years in civilian jobs," he said. "A nurse can use all his or her training during a four-year Air Force commitment — training that would get limited use in those same four years in civilian life."

Wilkes's Detachment 752 serves 44 cadets, mostly from Wilkes, but including students from Bloomsburg University and other area colleges. They represent undergraduate majors including engineering, computer sciences, communication, nursing and economics.

Matson, who took over leadership of the detachment in 1989, earned his undergraduate degree in animal husbandry at Texas A & M University and a master's in aeronautical science from Embry-Riddle Aeronautical University. He served as a navigator and bombardier in B-52s during the Vietnam war, as a squadron F-111 weapons systems officer and executive officer at Upper Heyford, England, and as an exchange officer to the Australian Air Force. He has taught undergraduate navigator courses and served as flight commander at Mather AFB, California.

## The Scientific Disciplines

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### Chemistry: Owen Faut, Ph.D., Chair

"Chemistry is the central science." That new slogan of the American Chemical Society, is equally applicable at Wilkes University, said Dr. Owen Faut.

Chemistry is basic to new medical advances, to molecular biology, to new material development from synthetic fabric to superconductors. Everyone needs a knowledge of chemistry, from the scientist involved in the most esoteric research to the parent trying to read food labels or dispose properly of leftover varnish.

"People get angry over plastic waste and oil spills and blame chemists," Faut said. "In fact, chemists are the ones who provide solutions to those problems." For example, he noted that the most recent issue of *Chemical & Engineering News* reported that a chemist had serendipitously discovered a very simple way to neutralize deadly PCBs. It wasn't the result of careful research, Faut said. It just happened. And if the person involved had not been a chemist, he probably wouldn't have

recognized the value.

Wilkes's chemistry department acknowledges the need for that fundamental understanding of chemistry in classes for non majors.

At the other end of the spectrum, all faculty members are involved in important research — Faut on jet engine liquid lubrication for NASA; Dr. William Swain on synthesis of organic chemicals; Dr. Howard Swain on physical properties of polymers and recycling polymeric waste, for example.

For the half dozen chemistry majors each year, the result is a research-oriented program that prepares them well for the best in graduate school and subsequent university, industrial or government work.

Dr. Paul Wendler, a 1969 graduate who teaches at Stanford University, earned chemistry's prestigious Coppe Award last year. Two students working with Dr. Swain earned first prize for their work in statewide competition. Two of Dr. Swain's students are engaged in Ben Franklin Partnership research. Senior Laura Allard earned a fellowship to spend the last half of her senior year doing research at the Lawrence Radiation Laboratory at the University of California at Berkeley.

"All the education and training is being relayed to a younger generation," Faut said.

"Students use all our instrumentation," Faut said, offering students hands-on experience with equipment many undergraduates never touch. Freshmen use pH meters and identify molecules by color. Spectroscopists routinely use the nuclear magnetic resonance machines.

"We can offer special coverage from vacuum ultraviolet to the infrared, enabling students to measure the light absorbing properties of almost any molecules in any ordinary and many extraordinary substances. It allows them to see molecules jump from one energy level to another and to watch them vibrate — to find the 'fingerprint' of molecules, so they can be identified."

The overall effect is that students leave Wilkes well prepared. "Every time we send people out, they amaze people with their ability and they gain confidence in it," Faut added.

### Health Sciences

#### Ralph Rozelle, Ph.D., Dean

Close academic advising, specialized counseling about career choices and placement in medical schools are the hallmarks of Wilkes University's premedical programs.

New this year is the Guthrie Premedical Scholars Program, an eight-year program in which students are admitted to medical school at Hahnemann University at the same time they are admitted to Wilkes. If they maintain appropriate scholastic achievement and scored above 1200 on the SAT, they are exempt from taking the Medical College Admission Test which removes a large burden from their shoulders. The program also includes an undergraduate semester at Guthrie Medical Center in Sayre, where students will observe outpatient medical care and engage in research projects.

The Pre-Medical Scholars Program joins a family of pre-medical and pre-health science programs.

A seven-year medical program in conjunction with the Philadelphia College of Osteopathic Medicine allows selected students to complete both an undergraduate and medical degree in seven years.

Wilkes also offers seven-year doctoral program affiliations in optometry, podiatric medicine and dental medicine along with allied health science programs in physical therapy, occupational therapy, health records administration, medical technology and pharmacy.

"The programs are successful," said Dr. Ralph Rozelle, dean of health sciences. In the 1991 graduating class, 5 students will move to PCOM under terms of the joint program, another 10 students have been accepted to optometry school, 3 to podiatric medicine, 2 to dental school, and more than 10 to medical school through the regular route.

Dr. Rozelle is a 1954 Wilkes graduate who began his graduate study at Pennsylvania State University and earned his Ph.D. in chemistry at the State University of New York at Alfred. A physical chemist, he returned to Wilkes in 1963 and became a full professor in 1967. He has been closely involved with the pre-professional programs since 1973 when the original Wilkes-Hahnemann program began.



## Engineering: Ahmad Armand, Ph.D., Chair

"We have the capabilities and the facilities to provide a fine education in engineering," said Dr. Ahmad Armand, chair of engineering. "We emphasize hands-on experience so that our graduates are engineers ready to solve problems."

Close interaction with faculty and significant laboratory time, including a strong research requirement, are augmented with student organizations, field trips and co-op educational experiences to produce well-rounded engineers, Armand said.

The key to a great engineering education is a great engineering faculty, Armand said, adding that Wilkes has been able to attract faculty who are committed to undergraduate teaching but actively involved in research.

A variety of grant-funded research projects not only keep faculty current but allow them to share their research work with students. In addition, grant-funded research often provides equipment which stays with the University after the project is complete.

Among the University's most important new laboratory equipment are the network analyzer system and time domain reflectometer in the microwave lab, robot vision system and numerical control machine in the computer aided engineering (CAE) lab, microprocessor development system in the microcomputer lab and digitizing oscilloscope in the electronic labs. The engineering department also maintains laboratories in mechanical engineering, computer assisted engineering, thick and thin film, materials processing and microelectronics.

Wilkes's engineering department has nearly 250 undergraduate majors in electrical engineering, mechanical engineering, materials engineering, environmental engineering, engineering management and the new BA program in applied and engineering sciences. Another 25 to 50 are enrolled in the master's program in electrical engineering.

Students frequently win top awards in undergraduate research competition.

Wilkes graduates generally go on to graduate school or take jobs in industry. Recent graduates have gone to prestigious graduate schools and to jobs with AT&T, Hughes Aircraft, P&L, Westinghouse, IBM, Harris Corporation, Hewlett Packard, Eastman Kodak and defense contractors.

Armand, who earned his Ph.D. at the University of Southern California, is doing research on optical information processing, working toward an optical computer in which the carrying media are photons rather than electrons. Their speed makes them valuable in defense programs such as the Strategic Defense Initiative to track incoming missiles and in medicine and industry.

## Earth & Environmental Science

Brian Redmond, Ph.D., Chair

"As we grow and expand our population and technology, we are expanding our impact on the environment, which is, literally, where we live," said Dr. Brian Redmond, chair of Wilkes's department of earth and environmental science. Because of that, E&ES has become a "hot topic" for students, who recognize the important role it will bear on their personal futures.

At an introductory level, E&ES seems easier than other sciences, Redmond said, adding that, in reality, the opposite is the case. "In chemistry you are dealing with one or two chemicals whose purity is known to the nth degree and are mixed under tightly controlled conditions. You look at a very isolated thing. In physics, at least in the beginning, you deal with isolated things like the path of a billiard ball."

By contrast, "E&ES is a dirty science. There is nothing pure about it. It's hard to figure out all the actors, let alone how many are participating and how much. The action is all happening at once, in a very uncontrolled way, and may take a million years to complete," he said. Because of that, introductory courses tend to be descriptive rather than quantitative. "It's a struggle to make it a science rather than an art."

To understand what's happening in a lake, for example, "you need to know a lot about chemistry, biology, physics, math and statistics. E&ES majors need that broad background."

"E&ES majors are close to being science generalists."

That general background, which sometimes makes the scientific specialist look down their noses, makes earth and environmental scientists "best at synthesis," he said. They know how to see the overview and which expert to ask when they need more detailed information.

The 50 E&ES majors study with a faculty that represents the broad scientific spectrum: Redmond, a geologist; Dr. Michael Case, an aquatic chemist; Dr. Sid Helzer, a geologist; Dr. Daniel Pindzola, a chemical engineer; and Dr. Venkat Chibolu, a chemist. Botanist Dr. Kenneth Klemow and historian Dr. Harold Cox both hold joint appointments with their home departments and E&ES. Next fall Dr. Dale Bruns, a toxicologist, will join the faculty as chair of E&ES.

In addition to chairing the department, Redmond serves as associate dean of the School of Science and Engineering. He earned his undergraduate and master's degrees at Michigan State University and his Ph.D. at Rensselaer Polytechnic Institute.

Brun, who will be the new chair, has taught environmental toxicology at the University of Idaho and served as president of EG&G Idaho, Inc., a consulting firm developing global baselines for the federal government.

the disciplines

## Physics: Roger Maxwell, Ph.D., Chair

"Physics is the basic science. All the others are really applications of physics — of the description of the laws of nature — to the specialized pieces of knowledge."

That basic status is reflected in the course enrollment for physics. Although the department now has 15 majors — nearly double the number 10 years ago — most of its students are majoring in something else. Each year, the department's core course introduces some 200 to 250 non-science majors to the universe and its constant laws as well as the scientific view of the universe. Physics for life scientists introduces another 100 to 120 students a year to the physical principles that underlie all their scientific work. Another 100 or more physics, engineering and chemistry majors meet physics in the general physics sequence, introducing mechanics, thermodynamics, wave motion, electricity and magnetism, optics and light.

Who majors in physics? People who want to know why things work, Maxwell said. People who want to make things work choose engineering instead, he said.

Wilkes physics majors may choose a bachelor of arts degree which generally leads to a high school teaching career or health professions, or a bachelor of science degree leading toward graduate school, industry, government laboratories. An additional bachelor of science degree is offered in medical and health physics for students who anticipate a career in the highly technical areas of health care. It is also suitable for pre-medical and pre-dental students.

"We have had graduates go into law, medicine, dentistry, radiative physics, industrial research, manufacturing research. Physics can be a stepping stone to anything."

"Wilkes's strengths," said Maxwell, "are in the time we are able to spend with students and in the radon lab, which offers students interaction with the community on a very important issue in nuclear physics."

Another strength lies in the faculty, Maxwell said. John Orlovsky's work with the Brookhaven National Laboratory gives students first-hand information on the latest research in high temperature superconductors. Irena Hostler's research in quantum electrodynamics is a model of theoretical physics. Fred Bellas, retiring this year, has provided stability to the program for years. Walter Plavec has a gift for making physics palatable for nonscientists. Jerome Kucirka provides a problem solving course for all physics majors as well as the engineers and Rosalie Lencoski is an expert on nuclear physics and Chernobyl radiation.

Before joining the Wilkes faculty, Maxwell worked with infrared detectors in industry, helping to build the infrared radiation detector to measure the atmosphere surrounding Venus.

Two of Maxwell's three sons are Wilkes graduates, Jeffrey '80 and Mark '91.

the disciplines

## Math and Computer Science

Bing K. Wong, Ph.D., Chair

It's not how much mathematics you have had before college but how well you understood it that determines your likelihood of success as a mathematics or computer science major at Wilkes, says department chairperson Dr. Bing K. Wong.

But even if you don't major in a mathematical science, most Wilkes undergraduates encounter the department to some extent. Seven of every ten classes offered by the department are service courses for students majoring in other disciplines, he said.

For those who do accept the challenge of a mathematics or computer related degree, the department offers three options:

Computer Information Systems — application oriented, training people to design computer systems or develop applications for business use.

Computer Science — more attention to systems level programming and computer organization.

Mathematics — preparing high school teachers; those who work as applied mathematicians, statisticians or engineering analysts, and potential graduate school students.

"We are pleased to see an increasing interest in advanced studies," Wong said, noting that about a dozen graduates are currently enrolled in Ph.D. programs.

Students have found many imaginative ways to combine the mathematics and computer science programs with others throughout the university for tailor-made programs. Suzanna Bernd, for instance, combined computer science with music, followed by a specialized graduate program, and is now a mid-level administrator with The Philadelphia Orchestra. (See story Page 10)

The Wilkes mathematics and computer science programs are especially strong because of a "top-notch" faculty who enjoy sharing fun time as well as work time with students, Wong said. They also provide excellent tutoring and encouragement to get through the calculus sequence and into the proof-oriented work that is the main concern of mathematicians — the work of discovering why what's true is true, he explained.

Wong left his native China in 1980 and completed secondary school in Hong Kong. He earned his undergraduate math degree at Pittsburg State University in Kansas and his master's and Ph.D. at the University of Illinois.

## Specialized facilities give Wilkes students an edge Microelectronics lab allows chip design

The microelectronics fabrication facility in the engineering department has been a unique part of the electrical engineering program. Executing a transistor manufacturing process is a memorable and valuable experience for students, no matter which particular area of engineering their career is related to.

In the microelectronics fabrication facility, they get hands-on experience with chemical clean-ups, thermal oxide growth, impurity depositions and drive-ins at elevated temperatures, and pattern transfers through photolithography. They also carry out extensive process testing, device testing and a variety of characterizations. The lab provides ample opportunity to do trouble shooting, because of the vast variety of equipment involved. Students also get to address questions regarding responsible disposal of hazardous wastes and are reminded of the fragility of our environment which cannot take unlimited abuse.

The lab is a healthy platform for college and industry cooperation incor-

porating the real world of engineering into the classroom. This lab, in particular, provides insight into the process involved in the making of integrated circuits. Established in 1973 through equipment donations from the RCA manufacturing plant at Mountaintop (now Harris Corp.), with sponsorships from the National Science Foundation and other federal agencies, it was housed in a first floor laboratory with a curtain separating the photolithography dark room.

Since its inception, it has steadily grown into a very fine facility for in-



Senior electrical engineering major Pat McDonnell works in the microelectronics lab with Dr. Vasu Choudhry, checking a transistor chip through the microscope.

struction, challenging student projects and research. It has moved to a large area in the basement floor with a formal dark room and a separate lecture room. Harris continues to provide necessary chemicals and equipment upgrades. A computer terminal and an on-line printer connected to the DEC mainframe in this lecture room make for easy access to software packages for process simulation, strongly emphasized in the curriculum. A new water purification unit provides higher yields. Mass flow controllers with many built-in safety features allow a variety of gaseous ambient in the high temperature furnaces. A state-of-the-art plasma etcher is now available for finer geometries. Available computer interfaces in microvolts open doors to programmed monitoring of furnace temperatures. Furnaces, quartz tubes and handling equipment have already been procured in preparation for a transition, expected within the next two years, from one-inch to two-inch wafers. We are also poised to enhance the capability of the lab to making of MOS devices and on to small scale circuits. This is expected to become a platform for additional senior electives as well as graduate level courses in MOS processing, circuit design, mask design and testing.

### Students benefit from chip lab

The advantage for Wilkes students who experience the microelectronics laboratory is dynamic. When they reach their first job, they already know the entire process of making an integrated circuit on a chip — from chemical cleanup to testing and redesign.

The Wilkes laboratory process includes 14 of the industry-standard 47-step process, covering all the basics of making and testing the circuit and supplying the background for confident entry into further research or industry. Undergraduates at most universities never experiment with the entire process.

"Many of our students go to companies that are designing chips," said Dr. Vasu Choudhry, who supervises the lab along with Dr. Vijay Arora and Dr. John Janeczek. "Our students have already designed chips — most have not."

Although they usually start out working on one tiny aspect of the overall process, "it's a valuable insight" to understand the process from beginning to end, said Choudhry. "It allows them to communicate with those doing other steps because they know the whole process."

"Everybody says the Japanese are doing better in all the semi-conductor research," said Arora. With experience in the microelectronics laboratory, "we send some very knowledgeable graduates into the marketplace."

Their knowledge and experience with the process allows them to "do more design rather than technician work."

## Scanning Electron Microscope gives biologists a closer look

Students who are pursuing modern science need to look into the fundamental units that build our universe.

Thanks to Bell Laboratories and the creative technical work of students, faculty and staff, Wilkes now offers its life science students the chance to work with a scanning electron microscope. Two scanning and one transmission electron microscopes are also available to students in engineering laboratories.

An electron microscope is valuable because of its high resolution and high magnification, explained Dr. Wilbur Hayes and Dr. David Long. Hayes is primarily responsible for the operation and maintenance of the microscope and teaching its use to students. Long and his students in histology and morphology are the primary users of the microscope.

The traditional light microscope shines a beam of light through a specimen and allows magnification up to about 1,000 times. In contrast, the electron microscope uses a focused beam of electrons, emitted from a heated filament, for illumination. The transmission microscope, which focuses a beam through a thin slice of the material being investigated, allows for magnification up to several hundred thousand times.

Instead of sending illumination through the material as in a light or

transmission microscope, the scanning electron microscope moves its focused beam back and forth over the surface. It offers the user a chance to observe surface structure.

Donated to Wilkes in 1983 by Bell Laboratories, the scanning electron microscope is specially suited to the needs of the life sciences.

"This operates at a lower temperature, which is better for biologists, who need to minimize specimen damage," said Long. "Biological specimens can be destroyed by too high a temperature."

In Hayes's class, "electron microscopy for the life sciences," selected students learn to prepare their own specimens — a complicated four-step process in which an item is preserved, has its water content replaced with alcohol and then the alcohol replaced by liquid carbon dioxide which subsequently evaporates. These steps are somewhat comparable to freeze drying except the careful exchange of liquid keeps the specimen from shrinking during the drying process, said Hayes. Then the item is coated with a thin film of gold palladium. When the specimen is placed in the microscope, secondary electrons are released from the gold palladium to create the visible image.

The images are visible on the screen of a cathode ray tube and can be photographed from it for repeated use.

In many institutions, fac-



This micrograph by Dr. David Long shows the surface of the tongue of a two-lined salamander, which is common in clear mountain streams near Wilkes. The small papillae help hold food and the large ones are for tasting. Only terrestrial feeders have the large taste receptors.

ulty research monopolizes the electron microscope, if there is one at all, Hayes and Long said. The Wilkes SEM is readily available for student research. Because students sometimes make mistakes, the equipment gets more wear and tear than most, but two students — Henry Novroski, an alumnus who is now completing his studies at Philadelphia College of Osteopathic Medicine, and Tom Barlow, a 1991 Wilkes graduate — have learned to service the machine and kept it up and running since its arrival at Wilkes.

Novroski also modified the machine to make it better suit Wilkes's needs.

Students in anatomy courses are most likely to avail themselves of the SEM and it is critical to Long's research in comparative morphology.

Currently interested in salamander oral morphology, Long is studying how the variations in the surface features of the tongue are related to feeding adaptation. Barlow is doing independent but related research on phylogenetic comparisons of tooth morphology.

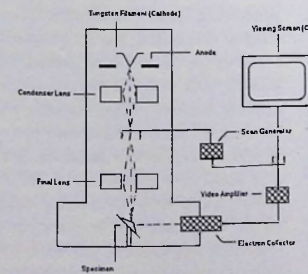


Diagram adapted from Art Champlin, Colby College

Specialized facilities give Wilkes students an edge

## Thick and thin film labs

### Thick Film

The Thick Film Laboratory is the heart of our hybrid microcircuit fabrication facility. Thick Film hybrid microcircuit is an electronic packaging and interconnection approach where electronic components and interconnections are printed on ceramic substrates. This approach assures low weight, small volume and high density circuits. Hybrid circuits are used for the most demanding applications including spacecraft, heart pacemakers, communications and navigational systems. Industry analysts predict the hybrid market in the United States will grow from \$7.8 billion in 1990 to \$9 billion in 1992. This growth is due to continuing change in the hybrid circuit functions. Designing and fabricating hybrid circuits require numerous and diverse skills and technologies and offer challenges to almost every scientific discipline.

For example:

Ceramic engineers evaluate and select substrates as base for hybrid circuits and are responsible for substrate fabrication processes.

Electrical engineers design and prepare circuit layouts for hybrids and define the electrical parameters of the materials used.

Mechanical engineers find challenges in designing the proper tooling for screen printing of thick film circuits, firing furnaces for high temperature curing of printed circuits and wire bonding equipment for semiconductor chips.

Electrochemists are responsible for high density hybrids with fine lines through plating and etching. They also study corrosion mechanisms.

Organic chemists specify adhesives for chip attachment, coatings and photoresists for masks and screen stencils and cleaning solvents used during different processes.

Metallurgists define the conduct-

tor, resistive and dielectric pastes for printing electrical circuits, eutectic attachments of chip components to the printer circuits, and sealing and packaging methods for completed circuits.

Physicists play a very important role in the design and fabrication of reliable semiconductor and integrated circuits for hybrids.

Housed in three rooms in the lower level of Stark Learning Center, the thick film research facility is used for research and research training in the area of hybrid microelectronics. Dr. Munawar Ahmad and approximately fifteen undergraduate and graduate students use the facilities regularly. It is available to 250 students and faculty members in electrical and mechanical engineering and physics.

Five major research projects are in progress using the facilities.

**Thick Film integrated circuits for high frequency applications.** This project involves fabrication of transmission line structures in different configurations, such as microstrip, strip line, slot line and coplanar line, using thick film printing techniques and characterization and modeling of transmission line discontinuities. Attempts are being made to find an outside sponsor to support this project.

**Surface mount techniques for high density/multilayer electrical circuits.** This project is funded by the Northeast Tier of the Ben Franklin Partnership program which promotes a cohesiveness between academic institutions and industry for the benefit of economic development of the state.

**Controlled Impedance Circuit Boards.** A probe and a probing system are being studied for testing controlled impedance circuit boards used in high frequency wave probing. A graduate

student is working on this project as part of his thesis. This project is also funded by the Ben Franklin Partnership.

**Fine line printing and etching.** Procedures for fine line printing of thick film circuits and fine line etching of copper clad boards are being studied for high density electrical circuits. This project is conducted under the University's Technology Transfer Program (see story on Page 21).

**Thick Film Superconducting Pastes.** High temperature superconducting materials in the form of printable pastes are being studied for high frequency application. A local paste manufacturer is considering sponsorship of this project under the Northeast Pennsylvania Industrial Resource Center, which is intended to assist manufacturers and promote modern technologies in the region.

**Senior Design Projects.** Among the senior projects completed in this facility have been microwave filter design using thick film techniques; design and fabrication of thick film directional coupler; thick film microwave amplifier; thick film multicathode oxygen sensor; fabrication of superconducting thick film resonator; hybrid microwave downconverter for MMDS television applications; patch antenna and array, and fabrication of slot line antenna and feedback network.

The three-room laboratory suite includes one room equipped for art work generation, photo reduction, photographic processing and for producing stainless steel masks used in thick film printing. A second room houses a screen printing machine, firing furnace, wire bonding machine and a testing station. The third room, new to the lab facilities, will house a complete metal etching station and a photo processing equipment. These labs will be among those renovated this summer, providing for a cleaner environment to help achieve repeatable results.

## tie Wilkes to regional industry

### Thin Film

From infrared missile detection systems to computer memories, from circuit board conductors to superconductor-Quantum-Interface devices to detect electromagnetic waves, thin film technology plays a key role in industry and is a necessary part of an engineering education.

Wilkes's thin film facilities play a dual role in the engineering curriculum and at the heart of the university's Center for Materials Processing & Diagnostics.

A solid material is said to be in the thin film form when it is built up as a thin layer of 1/20 millionth of an inch thick on a solid support, called a substrate. This is achieved by controlled condensation (deposition) of the individual atomic, molecular or ionic species in the region.

It is not simply the small thickness which provides thin film with its distinctive properties, but rather the microstructure resulting from the way it is built by progressive addition of basic building blocks.

Film deposition involves three main steps. First comes the production of appropriate atomic, molecular and ionic species. Second is transportation of the species to the substrate through a medium. Third is the condensation of the species on the substrate to form a solid deposit.

Major advances in the understanding of the processing technology of thin film have yielded materials and devices for use in the electronic, optical, magnetic and superconductor industries.

As an example, optical systems use thin film in infrared missile related detection systems, in protection coating against radiation damage to optical systems including lasers, in ultra-fast optical switching systems for telecommunications using fiber optics and in Erasable optical digital disc for high

density data storage for computer systems.

Microelectronics uses thin film in fast transistor and diode, conductors and dielectric materials; in circuit board conductors and dielectric substrates for electronic systems, in surface acoustic wave devices and in microwave integrated circuits for communications and radar.

Magnetic systems use thin film in computer memories, in thin film magnetic recording heads and in magnetic display.

Thin film also has applications in superconducting systems, in superconductor-Quantum-Interface devices for the detection of electromagnetic waves, in superconductor miniature antennas for communication devices, in system

shielding against magnetic interference and in 3-D sensors for detection of magnetic flux.

In addition to providing extensive opportunities for scientists in training, the thin film facilities function as the key element in the Center for Materials Processing & Diagnostics.

To date, the laboratory has been involved in projects sponsored by government and industry including the Naval Air Development Center and the Lesker Company. The facility has established a credible reputation not only in the area of thin films but also in the area of high temperature superconducting thin films.

At present, activities are concentrated in superconductors.

## Materials Processing & Diagnostics Major Equipment

### Processing equipment

electron-beam evaporation unit for optical coating  
combined three six-inch magnetron sputtering system  
three-inch RF reactive magnetron sputtering system  
two-inch RF reactive magnetron sputtering system  
ultra high vacuum evaporator system

### Diagnostics Equipment

X-ray diffraction diagnostics  
scanning electron microscope  
transmission electron microscope  
infrared spectrophotometer (transmission and reflectance)  
complete electrical and MW properties testing systems  
tearor thickness measurement unit

Specialized facilities give Wilkes students an edge

## Molecular Identification Laboratory

In chemistry, identifying structures is synonymous with finding out "what" a species is. This identification of compounds is central to any research activity that one may be involved with. For example, if you synthesize a new compound, you will need to identify it before you can do anything with it. If you make a known compound, you need to ascertain its identity. A compound's purity may be established before it can be used.

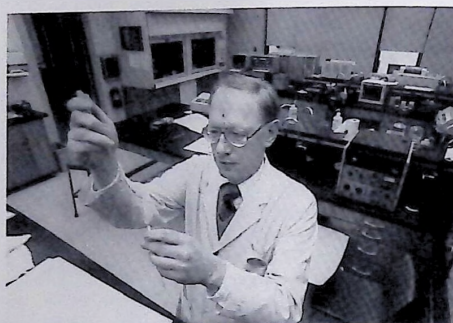
This identification of compounds is customarily achieved by use of more than one technique. In fact, just to be on the safe side, a chemist normally employs all the techniques at his or her disposal to be completely sure that the compound or compounds have been identified correctly. It is indeed unthinkable to assume that any one single method (with the exception of single crystal X-ray diffraction) can provide all the information one needs to identify or characterize a compound. Single X-ray diffraction methods for structure elucidation can be applied to only crystalline materials.

In this light, it makes sense to identify a center like the molecular identification laboratory where a collection of the various instruments available at Wilkes is identified and publicized for general use. Networking some of the key instruments like the Fournier trans-

form infrared spectrophotometer, the FT-NMR (for which funding is being sought), the gas chromatograph-mass spectrometer, and high-pressure liquid chromatography facilitates integration of the resulting data. Having all these methods at hand should make it possible to establish the character and identity of most substances. Identifying such a lab will make it easier for the entire Wilkes community to obtain assistance in chemical analysis of their samples. Such a lab can help coordinate the chemical analysis needs of various research projects going in the departments. In addition, such a lab can be of assistance to the local industrial needs and to the general public.

Students benefit directly from these facilities, said chemistry chairman Dr. Owen Faut. Junior level chemistry majors and science majors in other departments can take molecular structure in which they learn how to do the identification of compounds and separation of mixtures. They learn to use all the key equipment.

Chemistry majors are required to take the course because it is "fundamental to working with chemistry," Faut added. The courses are valuable to molecular biologists also, because they need to identify compounds when



Dr. Faut in the laboratory

looking for proteins and amino acids.

"The advantage here is that all students have access to top line equipment," Faut said, and they learn how to use it. While other schools might allow students to collect data from the instruments, a technician would operate it. "Here the students learn to run the equipment."

Recently, two students working with Dr. William Stine and the high pressure liquid chromatograph won first prize in a student research competition. Two more students are working with Dr. Howard Swain on a plastic recycling project.

Students are also involved in projects that are primarily faculty research. They work with biochemist Dr. Terry Wignot on her biomedical work; with Dr. Swain on his polymer work and with Dr. Faut on his lubricant work. Faut's current research involves film one molecule thick for use as lubricant surface—an extension of his work with NASA and the Lewis Research Center in Cleveland.

Students remember their experience at Wilkes after they graduate, Faut said. Don Demko '79, a research chemist with Anaquest, donated an NMR to the school last year, then came back in February to present a seminar for students about his work and the use of the NMR.

### Molecular Identification Lab

#### Key Equipment

Gas chromatograph-mass spectrometer  
High pressure liquid chromatograph  
Fourier transform infrared spectrophotometer  
Dispersive infrared spectrophotometer

## Reaching out to the region

By VAUGHN SHINKUS '91  
News Bureau Director

During the past 12 years, more than 250 area businesses have looked to Wilkes University for assistance in satisfying their technological needs — and each year Wilkes has responded through outreach services, extending its knowledge and resources to further the development of local industry.

The Technology Transfer Program began in 1979 when Dr. Umid R. Nejib, Dean of the School of Science and Engineering, recognized the need for a greater involvement in enhancing the economic posture of Northeastern Pennsylvania. Since then, the program has taken on a variety of projects, providing local businesses with the resources necessary to advance toward the 21st century.

Diversified Records Services, a West Pittston-based corporate records business, came to Wilkes in 1987 with what Diversified Administrative Assistant Jan Thyren described as a "major problem."

"Our customers had expressed the need for the emergency transfer of records to their out-of-state facilities," Thyren said. To this end, Diversified President Clifford Melberger sought to develop an idea he'd been considering for some time — satellite technology.

Thanks to \$145,000 in grants from Ben Franklin Partnership, Melberger — who is now a Wilkes trustee — was able to team up with Wilkes engineering professor Ahmad Armand to develop technology that will move Diversified into the next century. Diversified clients soon will transport and receive records via satellite through a process known as "electronic vaulting."

Projects like this one are all part of Wilkes's continuing effort to maintain a link between the University and local industry. For this reason, outreach is regarded as one of the school's most important programs. Randy Freas, coordinator of technology and business outreach, believes this type of bonding is crucial in the development of both the University and the community it is so much a part of.

"Wilkes is an integral part of its community committed to involvement in the region. We are prepared to assist local industry with our manpower, resources and

technology," Freas noted.

Since joining Wilkes from private business and industry in 1986, Freas has represented the University within the business community, serving as a liaison between local business leaders and the manpower and facilities offered at Wilkes. In this capacity he demonstrates to local professionals the range of technology and resources available to them through Wilkes.

Many clients are introduced to the transfer program through Wilkes's Annual Conference for Industry and Technology, an event which serves as a clearing house for outreach services. Project proposals are assessed based upon budget constraints and feasibility.

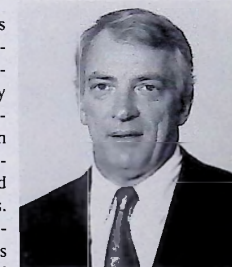
"It's important to show local industry that we're not just a sleepy little business school on the river commons," Freas said.

The Technology Transfer program also has a profound affect upon Wilkes education. Through outreach, professors are kept abreast of current problems and trends within their field. Consequently, students are given practical experience based on real-life problems.

According to Freas, technology transfer itself is just one part of generating outreach services. Faculty members often volunteer their time to outside projects, in addition to those attained through the Technology Transfer Program.

"It's a constant challenge to keep everyone involved in outreach. We assess the parameters of a given project, but it's the faculty that must tailor their schedules around teaching and research projects," said Freas.

Outreach does not end after a project has been completed. The faculty maintains contact with former clients to assure that projects have been properly instituted and make adjustments if needed.



Cliff Melberger  
President, Diversified Records  
Trustee, Wilkes University

### Wilkes's partners in business

Ingersoll Rand  
Air Products  
Bell Laboratories  
Offset Paperback, Inc.  
RCA  
St. Jude Polymer  
AEL, Inc.  
Herman Schwabe

Catrel, PA  
GE/RCA  
Metech, Inc.  
TEQ Corporation  
PED Corporation  
Calan Inc.  
Lehightronics  
Acton Technologies

Computer Aided Repair Service  
Darby Industries  
Injection Molding Corporation  
Midway Tool & Engineering  
Instrument Specialties Inc.  
Kurt K. Lesker Company  
and many others

## Scientific Centers tie campus and community Environmental Quality Center

A variety of facilities in one unit, the Environmental Quality Center offers the public "an independent, credible source for assessing environmental problems," said director Brian Redmond, Ph.D.

Included under the auspices of the EQC are the water quality lab, the Gas Chromatograph/Mass Spectrometry lab, the Guardia lab and the radon lab.

"Sometimes the public has questions about what's going on in the environment," Redmond said. They may want an additional source beyond the

public utility or Department of Environmental Resources they are dealing with. That's where Wilkes comes in.

"We have the capacity to assess and because we are independent and have no stake in the matter, our recommendations carry a lot of weight."

Before the specialty facilities were organized into the EQC, individuals would approach professors asking for their expert opinion. "A professor may not want to get involved in a controversial matter." When Redmond, as a colleague, solicits their information on

behalf of the EQC, the professors are more comfortable.

Beyond the questions and problems of individuals citizens, the EQC also fills a public service role because it fields countless questions from news media. One local reporter spent several hours backgrounding herself on radon before attending a special workshop for environmental reporters.

The EQC "creates an atmosphere that promotes the easy interchange of this vital information with the public," Redmond concluded.

## Water, Soil and Air Testing

The GC/MS, Guardia and inorganic water testing laboratories "can play a significant role in monitoring the health of the environment," said Dr. Venkat Chebrolu, who heads the GC/MS facilities. "Drinking water, raw source water and even municipal and industrial waste water can be subjected to this analysis."

The laboratories test effectiveness of water treatment plant procedures, filtration units and pilot plants, Chebrolu said. With additional capabilities for measuring organics in soils and air, the labs can make sure hazardous wastes are being contained, evaluate procedures for treating solid waste and sewage sludge and monitor incinerator discharges.

"Organics — including PCBs, pesticides, herbicides, phenols, polychlorinated biphenyls and aromatics — are becoming common household words," said Dr. Chebrolu. "Nobody wants them in the water we drink, the food we eat, the air we breathe or the soil we play on."

"Unfortunately, though correct, the term organics usually brings fear and uncertainty. While the risks involved with exposure to these various organics may be debatable, the need for detection and quantitative monitoring of these organics in our water, soil, air and food is not debatable."

The Wilkes EQC concentrates on complex projects for individuals, industry or government. While a private company might monitor a homeowner's soil, the Wilkes lab would monitor a watershed.

Brian Grant's microbiology lab searches out background information on waterborne *Cryptosporidium* and *Giardia*, offering information on its modes of transmission, life cycle, means of identification and treatment.

The lab has recently completed a major project for Calumet, a Swiss-based international corporation which polishes municipal waste helping to determine what would happen if the polishes under what conditions. They have also been

involved in lake monitoring, stream and watershed assessment, waste classification at the Tobyhanna Army Depot, testing for acid mine drainage and some residential well monitoring with Pennsylvania Power & Light.

## Radon Testing

The 50-cubic-meter radon chamber in Stark Learning Center "puts Wilkes on the leading edge in a nationwide effort to detect and control what some consider to be one of our most pressing environmental problems — radon," according to a major article in the October, 1989, issue of *Compressed Air* magazine, published by Ingersoll Rand.

Scientists have long been aware of radon — a colorless, odorless gas released naturally in the breakdown of uranium. But only recently have they tied radon and its decay products, known as radon daughters or radon progeny, to the 15 percent of lung cancer deaths which are not attributable to smoking.

The Wilkes radon testing facilities, lead by Dr. Roger Maxwell, combat problems in several ways. First, lab facilities are used to check results of radon testing. Charcoal canisters which have been exposed to room air to test for radon are analyzed to determine how much radon was in the room, by counting the gamma radiation emitted by radon daughters attached onto the surface of the charcoal granules.

More for teaching, the large radon chamber can be used to calibrate flow instruments and to test the effectiveness of devices designed to solve the radon problem. "Built from a walk-in freezer, the chamber is carefully sealed so that radon levels can be set and maintained precisely."

"Since radon has been recognized as a potentially significant health threat, it is important that instruments used to measure radon be calibrated so test results have some real meaning — so the number it generates really does tell you how much radon is there," said Maxwell.

## Scientific Centers tie campus and community Computer Aided Engineering & Manufacturing

Computer Aided Engineering and Manufacturing facilities are both a requirement for and a benefit of research work in tandem with the community.

Assisting local government and industry through Ben Franklin Partnership sponsored research requires "state of the art number crunching equipment, plotters, printers and peripherals," said Dr. S.M. Perwez Kalim, an assistant professor of mechanical engineering who directs the university's CAEM facilities.

Equipment purchased through various grants becomes the property of Wilkes and available to students and faculty for further research and industry application.

Computer aided engineering combines engineering design with the heavy number crunching in a quick and precise manner to transform a concept into reality using the tool of drafting.

Using CAE, Kalim recently headed a project with a local industry to design

a lift-seat chair for people with arthritis. The facilities have also been used for circuit design and analysis, plant facility layout, communication protocols, and finite element analysis.

In the same laboratory areas of Stark Hall, robots, conveyor systems, vision systems and

lathe machines are combined to create a computer aided manufacturing cell.

Computer aided manufacturing uses the computer to direct the manufacturing process itself. As components move along a conveyor, computer controlled robots and vision sys-

### Key CAEM Equipment

- 4 Vax workstations - VMS Operating System, WS 2000
- 3 VT 340 Graphics Terminals — Ultrix, miniframe
- 4 Macintosh II fx
- 2 IBM AT compatibles
- 1 DraftPro Plotter compatible to MAC VAX
- 1 Line Printer compatible to VAX
- 1 HP 7475A Plotter
- 2 Rhino Robots
- 1 Conveyor System
- 1 Vision system with 2 cameras
- 1 Numerical Control (NC) Lathe Machine

tems insure the selection of the right piece and finally send it to numerical machining to make the final product.

The goal is "zero time, 100 percent efficient manufacturing," Kalim said.

The facilities are used nearly 24 hours a day for teaching and research, he added.

Ben Franklin partners have included a variety of Northeastern Pennsylvania businesses such as Mizup Signs, Ham's Soldered Goods, Computer Aided Repair Service, Mitec Aluminum, TR Associates, Precision Tools and Minn Tools.

The partnership arrangement is ideal for students who "have to have" this training to compete in the job market, Kalim said. At Wilkes, students are involved in virtually every project, all of which represent applied engineering problems.

## Science lab renovations in progress

Stark Hall is shrouded in plastic and labs are crowded with each other's equipment as the Wilkes University biology, chemistry and physics laboratories undergo major renovation this summer.

The multi-million dollar project includes both the renovation of facilities and the acquisition of equipment for state-of-the-art, interactive teaching.

"We are focusing on biology, chemistry and physics not only because they are the core of our natural science curriculum, but also because they are the basic foundation of all of our professional programs, specifically engineering and medicine," said Dr. Umid Negrin, dean of the School of Science and Engineering.

Equipment changes will reflect the changes that have occurred within the various fields of study.

The study of biology, for example, has been transformed by advances in molecular biology, cellular physiology and microbiology. The renovations will support a variety of new learning opportunities in these fields.

Chemistry facilities will be better prepared to handle senior level research, a must for students planning on graduate school or industry.

Likewise, the physics laboratories will incorporate computers and related software to allow physical process calculations and simulation demonstrations.

The renovations should be completed before school starts in the fall.

In addition to the CAEM and Environmental Quality Centers, Wilkes requires its 100 full-time facilities as an outreach center to provide technological assistance to the community. These facilities are highlighted on Page 16. A Center for Theoretical Studies is in the planning stages.

# The Chronicle

## Schiowitz Hall dedicated May 10

By MARK DAVIS

The South Franklin Street building that houses the Wilkes nursing department has been dedicated and named in honor of Nathan Ned Schiowitz.

A noted community leader, Schiowitz leads his family's business, General Supply & Paper Company in Wilkes-Barre.

The University named the building Schiowitz Hall in recognition of his major gift to the Wilkes Tomorrow Campaign.

"We are pleased and honored to add the Schiowitz name to the Wilkes University campus," Wilkes President Christopher N. Breiseth said at the May 10 ceremony. "This building stands as proud testimony to the Schiowitz family and its dedication to this community, this city and the University."

Schiowitz Hall was built in 1999 and acquired by the University in 1973. The building is listed as significant on the State Historical Registry.

During the last few years Wilkes has done extensive renovation work, re-



Nathan Ned Schiowitz accepts congratulations from his sisters-in-law Jean (Mrs. Albert) and Rosemary (Mrs. Morton) at the dedication of Schiowitz Hall May 10 while other friends enjoy the celebration.

storing the building to some of its architectural excellence. The renovations included a new roof, new rear porches, a new heating plant, new carpeting for the first and second floors, exterior and

interior painting and landscaping.

A native of New York City, Schiowitz moved here with his family in 1907 and has lived here ever since, except for service in the Air Transport Command of the U.S. Army Air Corps from 1942 to 1946.

From 1924 to 1975 Schiowitz was a driving force behind General Supply & Paper Company as it grew and developed, attaining its present position as a leader in the packaging industry.

Active in the community, Schiowitz has lent his energies to many important causes dating back to the Jewish Welfare Board (1940-44) and the flood caused by Hurricane Agnes in 1972. He was the chairman of the Jewish Community Center's Flood Reconstruction Committee.

Schiowitz serves on the boards of the Jewish Federation of Wilkes-Barre, where he is treasurer, the United Hebrew Institute, Ecumenical Enterprises, Inc., and the Jewish Community Center. He is former president of the Board of Congregation Ohav Zedek, and a member of the Iram Temple Shrine.



EARTH DAY 1991 brought together representatives of environmental groups, industry, government and education under the auspices of Wilkes, the World Futureists Society and the Economic Development Council of Northeastern Pennsylvania. Shown here (from left) are: William Eberhardt, Ph.D., of the Procter & Gamble Paper Products Company, which helped sponsor the event; Robert J. Heaman, Ph.D., assistant to the president at Wilkes; Howard Grossman, director of the Economic Development Council; and Sid Halsey, Ph.D., a professor of earth & environmental sciences at Wilkes. The day-long celebration, which featured discussion and entertainment, culminated in a town meeting on environmental issues televised from the Stark Learning Center.

## Wilkes Tomorrow, Annual Fund hit new success records

The WILKES TOMORROW Campaign is closing in on its \$23 million capital campaign goal. More than 450 individuals, corporations, and organizations have already made contributions to the capital campaign which concludes in December.

Only \$500,000 more is needed to reach the goal of \$23 million, said Wanda Willis, assistant director of the Capital Campaign.

Centerpiece of the six-year capital campaign is the Arnaud C. Marts Sports and Conference Center, which opened in 1989 and played host to the University status celebration a year later. Funds from the capital campaign are also used for faculty salaries, scholarships and endowments for the school.

### Annual Fund

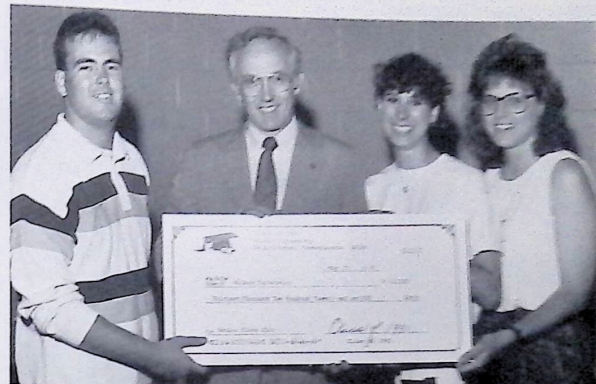
Contributions from alumni, parents and friends of Wilkes University account for the success of the 1990-91 Annual Fund. This year's drive totaled \$669,381, an increase of \$94,711 over the 1989-90 campaign.

Wilkes has placed a major emphasis on alumni support, said Bernadette Formicola, director of annual giving. The positive response by Wilkes alumni to the Annual Fund direct mail, phorathon and personal solicitations has increased the rate of alumni participation to 25 per cent.

"The money collected in the Annual Fund is essential and used for day-to-day educational purposes," Formicola said.

The  
*John Wilkes Club*  
Dinner

Friday  
September 13, 1991



Leaders for the senior gift drive presented a mock check to President Breiseth. From left: William Hanigan, Dr. Breiseth, Kim Zoka and Amy Schukis. Seniors kept on giving after the presentation, raising the total from \$13,320 shown on the check to \$14,320.

## Seniors pledge \$14,320

Even before graduation, members of the Class of 1991 became alumni in good standing — pledging more than \$14,000 to the Annual Fund.

The new Senior Class Gift program allows new alumni to pledge a steady increasing gift over the next five years, from \$10 this year to \$30 in 1996, for a total of \$100. With 147 students participating — most with a full \$100 pledge — the Class of 1991 has made a total 5-year pledge of \$14,320.

Amy Schukis, president of the Class of 1991, led the fund drive along with Kim Zoka, president of the Commuter Council, and William Blumgren, president of Student Government.

## Herbarium named for Joel Rosenthal

The Wilkes University Biology Department Herbarium was recently dedicated in memory of Joel Rosenthal, Rosenthal of Bridgeport, Connecticut was a senior biology major with a 4.0 average when he was killed in a car accident in May, 1980.

The money used for the further development of the herbarium will come from the donations to the University in his memory. The herbarium is a collection of pressed and preserved plant specimens used in research projects for the scientific community and the community at large.

"Joel was one of the few students with an interest in plants. He was very interested in herbal medicine and planned to further his knowledge of the field," commented Dr. Ken Klenow,

associate professor of biology. Wendy Boehman, of Cream Ridge, New Jersey, was honored for being the first recipient of the Joel Rosenthal Award for the Outstanding Graduate in Organismal Biology at the herbarium dedication ceremony.

## Saad '93 wins award

Rima Saad, a junior biology major, has won a \$1,000 scholarship from The Friends of Lebanon Foundation in New York City. The selection was based on a paper Ms. Saad wrote about Lebanon, which contained her personal reflections on her parent's native land. Born in the United States, she attended high school in Lebanon. Saad hopes to attend medical school following her graduation from Wilkes.

### The 1991 Kimball Lecture

## How the fossil record supports evolution

The fossil record of life, historically seen as an argument against the theory of evolution, actually bears it out and explains some of the big jumps in the orderly evolution of species, said Niles Eldredge, when he delivered the Grace Kimball Memorial Lecture at Wilkes University recently.

Eldredge, a paleontologist who is chairman and curator of the department of invertebrates at the American Museum of Natural History, said the apparent disharmony between evolution and the fossil record had long been seen as an argument against the validity of Charles Darwin's original theory.

In discussing evolution, it is always necessary to begin with Darwin, Eldredge said, because Darwin made "a genuine discovery" when he outlined the theory of natural selection. His 1859 work, *The Origin of Species*, was written in part to convince his peers that life has a long history. The word "evolve" was not used until the final sentence of the book, Eldredge noted.

Scientists today believe the Earth has existed for some 4.5 billion years, with life for 3.5 billion years. At Darwin's time, creationists argued that the world was 6,000 years old, based on the scholarly endeavors of individuals who had calculated through the "begats" of the Old and New Testaments. Darwin correctly contended that life had been on earth for 10 to 20 million years.

Even so, he was troubled that the fossil record of life did not agree with his theory.

As the science of genetics developed in the late 1800s and early 1900s, the first geneticists tried to repudiate Darwin's work. By the 1930s, three mathematically inclined geneticists, R. Fisher, S. Wright and J.B.S. Haldane, "ironed out" the genetic mechanism of Darwinism.

A decade later, a synthesis was developing which tied natural selection and evolutionary biology with the study of genetics. In 1944, George Gaylord Simpson published a book reconciling genetics with paleontology. Eldredge's work follows those premises.



At the Kimball lecture, from left, Biology chair Lester Turoczy, speaker Niles Eldredge, biology professor Michael Steele and Science & Engineering Dean Umid Nejib.

"Fossils show patterns that are not apparent just by looking at life," Eldredge said. Bats and whales offer good examples, he said. Evolutionists had long theorized that bats and whales had evolved and adapted to different conditions than their mammal ancestors. But the fossil record shows they developed before mammals, he said.

"Evolution is not a slow steady change through time," Eldredge said.

Instead, sudden environmental changes wipe out some species and others, better adapted to the altered conditions, come to the fore.

"When sudden climatic changes occur, the most likely result is extinction — the least likely is genetic change."

Although Eldredge does not deny the importance of Darwin's "natural selection" in microevolutionary events, he questions whether this process is responsible for the large scale patterns of speciation observed in the fossil record.

The author of an extensive list of publications, Dr. Eldredge has two books due out this fall: *Miner's Canary*, which examines mass extinctions, and *Fossils*.

### Alumni who have represented Wilkes at

## Presidential Inaugurations

William S. Raub, Ph.D., '61, Howard University, Washington, DC, April 5.  
Thomas M. Saba, Ph.D., '63, State University of New York at Albany, April 5.  
Alan E. Zellner '72, Community College of Philadelphia, February 17.

## Great Professors: Cromwell Thomas

By HEIDI HOJNOWSKI

All engineers are builders, but Professor Emeritus Cromwell Thomas built more than highways and bridges. He built two great Wilkes traditions — the engineering department and the wrestling team.

Thomas began teaching in Bucknell University Junior College's physics and engineering department in 1938, but his influence soon spread across the curriculum. Along with "traditional" physics/engineering classes, he taught more than 19 different topics, including economics. He "filled in" and "filled out" the curriculum. Using his knowledge of civil, mechanical, and electrical engineering, Thomas introduced new classes. His versatility and innovation helped solidify the scholarly reputation BUJC wanted to establish.

Whether he instructed the surveying or statics and dynamics or Engineering War Science Training Program classes, Thomas brought the same caring spirit to all. Dr. Frederic Bellas, professor of physics, remembers Thomas's "personality and kindness." Both a student and colleague of Thomas, Bellas says, "His genuine interest and concern for Wilkes and its students is unparalleled." Calling Thomas "one of the kindest persons at Wilkes," Bellas recalls that Thomas "never promoted himself — only and always Wilkes and its students."

Dean Umid Nejib of Wilkes's School of Science and Engineering echoes Bellas's sentiments. According to Nejib, Thomas was very "low profile." Though he may have been understated, he was noticed. "Students liked him, colleagues liked him," says Nejib. "He knows so many people, and so many know him."

Thomas, a registered civil engineer, brought one of the first Pennsylvania Society of Professional Engineers (PSPE) chapters to campus and founded one of its oldest student chapters. He practiced his professional expertise by helping to design the addition to Stark Learning Center and acting as

its clerk of the works.

While Bellas and Nejib regard Thomas as a founding engineer, John Reese, athletic director and head wrestling coach, calls him the "father of wrestling."

A former wrestler for Washington and Lee College in Virginia, Thomas remembers practicing with his first team in "garages and carriage houses. We rented space in St. Stephen's Church House," says Thomas, "and had to roll up the mats when we were finished so the basketball team could play." Though facilities were short, spirit was not. "We always broke even," Thomas recalls.

Thomas adds a "personal touch" even to today's program, says Reese. He has served as head scorer for the Wilkes Open Wrestling Tournament since its origin in 1951. His name and dedication have been memorialized in the Cromwell E. Thomas Outstanding Freshman Scholarship which is awarded to the outstanding freshman wrestler in his sophomore year, recognizing the athletic prowess and scholarly endeavor Thomas's career exemplifies.

Now a professor emeritus, Thomas lives in Dallas with his wife, Beryl, who is a retired principal of Wyoming Valley West High School, Plymouth.

Only the paperwork shows Thomas as retired. His interest in the university and its students continues. "He was always very interested in students, and he maintains that interest," says Bellas.

Thomas also helps his community. He is an active member of the Welsh Congregational Church, Edwardsville, and serves as Recorder for the Irem Temple Shriners. He joined the philanthropic group over fifty years ago because, "They were good people, and good people make a great organization."

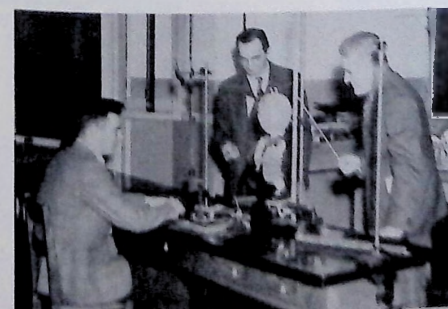
Bellas recalls when Thomas said something similar about Wilkes: "The real value of an academic institution lies in its faculty not its physical plant."

Calling Thomas one of its own is a great accomplishment for Wilkes.

What is Thomas's greatest accomplishment? After reviewing more than fifty years of service and achievement to Wilkes and its community, Thomas claims his greatest accomplishment is that "I enjoyed most of my life."

This is an engineer made of the finest material.

Heidi Hojnowski is a junior English major from Nanette and a Presidential Scholar.



From the Annals, 1947

# Alumni News

1950

Lawrence S. Stepelevich received The Catholic University of America Alumni Achievement Award for his work in philosophy. He is a professor at Villanova University.

Robert S. Capin, President Emeritus of Wilkes University, has been selected to receive The Seligman J. Strauss Lodge No. 139 of B'nai B'rith Community Service Award.

1954

Alden Wagner was named vice president of Pennsylvania Power & Light Co.'s Lancaster Division. He and his wife, Elsie Jean, have two sons, Paul and Mark.

Gerald J. Levandoski has been appointed to the board of directors of The First National Bank of Danville. He is plant manager for Merck & Co.'s Cherokee Plant in Riverside and lives in Danville with his wife, Ann.

## On the Great White Way

### Alumni plan Miss Saigon trip

The Wilkes University Alumni Association is sponsoring an Oct. 26 benefit trip to see the hit musical, *Miss Saigon*, at the Broadway Theatre, New York City. Set against a backdrop of the Vietnam War and the fall of Saigon in 1975, the musical retells the *Moulin Rouge* story as a romance between an American Marine and a Vietnamese bar girl.

The Wilkes group will attend a 2 p.m. matinee performance on Saturday, October 26. Orchestra seats are \$90 each. After the show, alumni and friends will gather for a buffet dinner at the Holiday Inn Crowne Plaza, 49th and Broadway. Cost for dinner is \$40 per person with a cash bar available. Bus transportation from Wilkes will be offered for \$20 per person, round trip, if there is enough interest. For reservations contact the Alumni office.

## Mark your calendar

July 28	Allentown - Dorney Park & Wildwater Kingdom Wilkes Alumni Family Picnic
August 24	Baltimore - Washington, DC - Virginia Wilkes Alumni Crab Feast Hosts: Dr. and Mrs. Joseph Stephens '51
October 18-20	Homecoming Weekend
October 26	New York trip for Miss Saigon performance
October	Boston area alumni New England Aquarium Whale Watch

For further information about any of these events, call the Alumni Office, 717-824-4651, extension 4130, or 800-572-4444 (PA), 800-537-4444 (outside PA).

1957

Robert W. McGurrin, Ph.D., a teacher with the Department of Defense Schools System, has taught in France, Tokyo and England. He also works with the Shakespeare at Stratford program for American teachers.

1959

Stephen J. Echan retired with 25 years of service as Saginaw County Equalization Director in Saginaw, Michigan, where he lives with his wife, Sandra.

1961

Cathy Brominski Kovac announced her engagement to Joseph J. Stefaniak of Ho Ho Kus, New Jersey. Cathy is a member of the nursing faculty at Haverford State Hospital, Haverford.

Raymond S. Litman has been named to the Advisory Council of Purdue University's Credit Research Center. Raymond is senior vice president for Manufacturers Hanover Trust Company's Retail Card Services Group in Hicksville, New York. He resides in Plymouth Meeting, Pennsylvania.

1962

Audrey A. Coslett was named assistant vice president at First Eastern Bank, Wilkes-Barre. She is a member of the bank's mortgage department. She and her husband, Robert, have three children, Lynne, Craig and Jason.

Janet Simpson Dingman, Ph.D., is president-elect of the West Virginia Association for Counseling and Development. Janet is currently in full-time practice as a licensed professional counselor and also teaches part-time at Marshall University. She and her husband, Robert, reside in Huntington.

C. Kenneth Fox has been elected to the board of the Pennsylvania Professional Photographers of America. He is the owner of Fox Studio, Wilkes-Barre.

1963

Sharyn Yanoshak Conkey has joined the corporate communications department of Nevada Power Company as employee communications administrator. She will supervise company/employee activities and publications. Sharyn resides in Las Vegas, Nevada.

Michael A. Russin was appointed vice president and director of operations for the electro optical products division of ITT in Roanoke, Virginia. Michael and his wife, Josephine, have two daughters, Jennifer and Hillary.

1964

Lou Coopey was named Professional Photographer of the Year by the Phoenix, Arizona, Professional Photographers Association.

1968

Robert A. Beeler recently married Helen Joyce Wint of Wilkes-Barre. He is employed as a chef at Wilkes University, where he has worked for 20 years.

Nancy Noterman Downing graduated with a bachelor of science in elementary education from York College of Pennsylvania. She is a substitute teacher in the local school district.

Leilani A. Hall received a master's in library studies from Rutgers University, New Brunswick, NJ. She is an assistant librarian in the Engineering Library at Princeton University, and lives in Piscataway, NJ, with her four children.

Edward J. Podelt is controller for United Penn Bank and has been elected to serve as president of the Pocono Chapter of the Bank Administration Institute. He and his wife, Elizabeth, are the parents of three children, David, Daniel and Sarah. They reside in Dallas, Pennsylvania.

## Alumni News

29

1969

Owen Costello was named the 1990 recipient of the John B. Kelly, Jr. Memorial for Outstanding Citizen Award. The award, given by Geriatric and Medical Centers, Inc. in Philadelphia, honors state residents for their involvement with youth and sports. Owen is the executive director of the Keystone State Games, Inc., Wilkes-Barre.

Elwood Dean Jones was promoted to field division claims manager at National INS Co., San Antonio, Texas.

Joseph C. Wiendl recently transferred to California with Ingersoll-Rand Construction and Mining Division handling direct sales in the Bay area and major accounts in San Francisco. Joe and his wife, Anna Marie, and four children reside in Manassas, California.

1971

Bonnie Gelles was named to the board of directors of the Greater New York Bridge Association. Bonnie is the director of communications at Martin E. Segal Company, New York, New York.

## Extra friendly skies

Two San Francisco-based United Airlines crew members, chancing during a stopover in Philadelphia, discovered they had more in common than the Friendly Skies.

William Price '57 and Deanne Grietzer Jones '72 discovered they were both Wilkes alumni.

Price, formerly of Nanticoke, has been piloting with United since 1963. He is currently a DC-10 captain and lives in Redwood City, California. When Captain Price isn't airborne, he teaches a course on "Human Factors in Aviation" at San Jose State College.

Jones, formerly of Kingston, has been a flight attendant since 1973 and now lives in Menlo Park, California.

"The roots of Wilkes University run deep," said Jones. "Look for us both the next time you're flying on United Airlines!"

## 'Bartuska '49 wins Presidential Award

Doris G. Bartuska, M.D., '49, was honored recently with a President's Award from the Medical College of Pennsylvania. A 1954 graduate of Medical College of Pennsylvania, Dr. Bartuska was commended as an outstanding representative of the school in significant professional societies, including past president of both the American Medical

Women's Association and the Philadelphia County Medical Society. She is shown here with President D. Walter Cohen, D.D.S., who presented the award, and Roselynn Payne Epps, M.D., MPH, F.A.A.P. of Washington, D.C., current president of the American Medical Women's Association and keynote speaker at the presentation ceremony.





**Robert Tinner** was named vice president and consumer services division manager at First Peoples National Bank in Edwardsville, Pennsylvania. Robert lives in Indian Lake with his wife, Ann.

## 1972

**Blase L. Gavlick, Esq.**, is vice president and regional trust coordinator of Hamilton Bank, Core States, Reading.

**Linda Lanzone** recently married James Suponic. Linda is employed in the Luzerne County assessor's office.

## 1973

**John J. Margo** was named director of human resources at the Oneida City Hospital in Oneida, New York. He and his wife, Peggy, reside in Oneida.

## 1974

**Bernard J. Healey** has earned a Ph.D. at the University of Pennsylvania. He is employed by the Pennsylvania Department of Health in Kingston and teaches at Wilkes. He and his wife, Kathy, are parents of Alison and Bryan.

**Robert Lussi, CPA**, recently acquired the accounting practice of Slamon and Company. He and his wife, Nettie, and their two children, Jaime and Joelle, live in Wilkes-Barre.

**David J. Yeosock**, a partner in Yeosock Funeral Home, Plains, has been appointed to the Metropolitan Advisory Committee of First Eastern Bank

## 1975

**Robert Skrinak** has been appointed supervisor of a partial hospitalization program at the Community Counseling Services of Northeast Pennsylvania, Wilkes Barre. Bob and his wife, Kathryn, announce the birth of a son, Robert, in September.

## 1976

**Raymond B. Ostroski** has been named vice president and general counsel for

## Alumni gather across the country

*In Bethesda, Maryland*



At left, from left: Gary Sanchez '87, Marc Graves '89, Dean Emeritus George Ralston, Lisa O'Neil, Gene Wachowski '85, Al Melusen '85, and Shawn Miller '87.

At right, from left: Pam Jones '83, Guy "Pinky" DiZebba '76, Janet Macik '75 and Paul Macik '76.



*In Palo Alto, California*



Above, from left, Deanna Grietzer Jones '72, Tom Jones, and Joseph C. Wiendl '69.



Above, from left, President Breiseth, Michael F. Bianco '62 and Gary Zellner, brother of assistant wrestling coach Al Zellner '72.

C-TEC Corp. He resides in Wyoming, Pennsylvania.

**Linda Papatopli** is teaching at Boston College in Chestnut Hill, Massachusetts. She and her husband, Donald, and son, Patrick, reside in Boston.

**Donna Geffert Yozwiak** and her husband, Larry, announce the birth of Alexandra Veronica Feb. 1. She joins brother Nathan, 8, and sister Andrea, 4.

They live in Brodheadsville, Pennsylvania, where Donna is an English and journalism teacher at Pleasant Valley High School. She also advises the national award-winning yearbook, Bruin, completing her 15th year and the 12th first place national journalism award from Columbia University Scholastic Press Association.

**Theresa Domanski Jones** and husband, Jay, announce the birth of a daughter, Caroline, in January. Theresa does freelance art work for area businesses. They reside in Binghamton, New York.

**John Jastrem** has been named senior vice president and chief financial officer for Knapp Communications Corporation. John resides in Redondo Beach, California.

## 1977

**Nelson Ashburner** was recently presented the Community Counseling Services Staff Appreciation Award. Nelson has been a therapist with Community Counseling Services for five years. He lives in Dallas, Pennsylvania.

**Jon Metta** has been named assistant vice president at First Eastern Bank. He is in the Investment Banking Department. Jon and his wife, Karen, have a daughter, Tia.



## Baron '75 joins IMG

John Baron has joined Insurance Management Group (IMG), headquartered in Wilkes-Barre, providing insurance and investment counseling to clients throughout eastern Pennsylvania.

A specialist in investments and an independent contractor with Robert Thomas Securities, Inc. (member NASD/SIPC), Baron has access to every market and the complete range of financial services and products to offer a full-service brokerage operation.

A member of the Board of Directors of the Wilkes-Barre Family YMCA, Baron is president of the Wilkes University Alumni Association and a member of the Wilkes Board of Trustees. He is also affiliated with the Westmoreland Club, Wyoming Valley Country Club, and St. Maria Goretti Church, Laflin.

Baron and his wife, **Christiana Miele '73**, have two daughters, Kristina and Jenna.

## Alumni gather across the country

*In San Diego, California*

Below, Kenneth Stone, Esq. '74, Tami Stone, Ana Luong and Tu Chau "Joe" Luong '84.



*In Manhattan Beach, California*

At right, from left: George Offshackle '75 (on floor), Bruce Horn '89, Christine Allen, Robert Milmoe '75, Velina Schifano Milmoe '76, Edward Strucke '67, Patricia Novak Strucke '67.



At left, from left, Patricia Novak Strucke '67, Steve Mendelsohn, Michele Hastie Mendelsohn '67, Dana R. Ward '67, Sue Lee, John F. Jastrem '77, Regional Alumni Vice President.

Jeffrey D. Renoe earned his MBA in marketing from Drexel University. He is director of financial analysis for Campbell Soup Company. He and his wife, Ethel, and their daughter, Elise, reside in Glen Mills, Pennsylvania.

## 1978

Bruce R. Drum was named Labor Relations Manager for K-D Tools, responsible for facilities in Lancaster and Baltimore. Bruce and his wife, Karen, and their son, Derek, live in Lititz, PA.

Sandra Richelmi Field was elected to a four-year term as tax assessor for Lake County, Colorado. Her husband, Clifford Field, M.D., '80, is a family physician with Leadville Medical Associates.

Gary R. Good, M.D. is a resident physician at Harrisburg Hospital, Pennsylvania. Gary earned his medical degree at the American University of the Caribbean in Monserrat, British West Indies. He did his clinical training in Dublin, Ireland, and his internship at West-ern Pennsylvania Hospital, Pittsburgh.

David Jolley recently attained certified level status in the American Society for Health Care Marketing and Public Relations Professional Achievement Program. David is vice president for public affairs at the Geisinger Wyoming Valley Medical Center and lives in Larksville.

Major Clark F. Speicher was deployed to Saudi Arabia for Operation Desert Shield. Clark is Mission Crew Com-

mander on the E-3 Airborne Warning and Control System aircraft. He is assigned to the 964AWACS, Tinker AFB, Oklahoma.

## 1979

Michael J. and Janet Vierbuchen Briel '81 announce the birth of their first child, Katlyn Maureen, in 1990. Mike is vice-president and controller of Schlage Electronics, a subsidiary of Westinghouse Electric Corporation. Janet is a nurse manager at Stanford University. Both Mike and Janet hold MBAs from the University of San Francisco. They live in Belmont, California.

Joseph P. Lavelle, Esq. and his wife, Kathy Mlodzienski '80, announce the birth of a daughter, Remy Kathryn, in June, 1990. Joe is a partner at Howrey & Simon Law Firm in Alexandria, Virginia.

Capt. William Bradley McLennan received his MS degree from Golden Gate University in 1988. He and his wife, Joni Rae, and their son, William Patrick, reside in San Francisco.

## 1980

Mark Bohn, M.D. has joined the medical staff of Wilkes-Barre General Hospital. He practices in Mountaintop.

Francis M. Cantaflo, a physical therapist, recently joined the staff at Mercy Hospital, Wilkes-Barre. He resides in Scranton with his wife, Patricia.

Roger J. Davis, CPA, is a partner in charge of personnel for Schmelter, Master & Co., P.C., of Philadelphia. Roger resides in Elkins Park.

Laurie Williams Taylor received an M.S. degree in geology from the department of geologic and atmospheric sciences at Iowa State University. Laurie is employed as a health physicist for the Department of Environment Health & Safety at ISU.

## Wilkes alumni, trustees lead all Wilkes-Barre Partnership groups

Three Wilkes University alumni and a member of the Wilkes Board of Trustees have been selected to lead the Greater Wilkes-Barre Partnership and its three affiliate organizations. Eugene Roth, Esq., '57, is chairman of the Greater Wilkes-Barre Partnership, which offers a unified voice for business and economic growth in the area. Roth is a partner in the firm of Rosenn, Jenkins and Greenwald.



Eugene Roth



David Baltimore

Marino J. Santarelli '73, vice-president of United Penn Bank, is the new chairman of the Greater Wilkes-Barre Chamber of Commerce. David M. Baltimore, a Wilkes trustee, is the new chairman of the Committee for Economic Growth. A prominent local businessman, Baltimore headed WBEZ-TV and radio for many years before turning his attention to his own Baltimore Company. Libro Ciarmatori '72, '78, a senior vice president of Merchants Bank, was chosen to chair the Greater Wilkes-Barre Industrial Fund.



Marino Santarelli



Libro Ciarmatori

Marla Brodsky Wright and her husband, Jeffrey, announce the birth of a son, Andrew Philip, on Sept. 25, 1990. They reside in Levittown, New York.

## 1981

Glenn P. Coopey graduated from Golden Gate University in December, 1990, with an MPA degree in human resources management.



### Zale '78 joins GE

Lawrence P. Zale has joined the GE Research and Development Center as a partner attorney.

After completing his B.A. in physics at Wilkes, Zale earned an M.S. degree in 1981 in biomedical engineering from Drexel University and his J.D. in 1989 from Franklin Pierce Law Center in Concord, N.H. Prior to joining the R&D Center, he worked as a programmer with Computer Science Corporation first at the Kennedy Space Center, and later in Moorestown, N.J., and as an electronic engineer with Martin Marietta in Orlando and at Tobyhanna Army Depot. Most recently, he was a patent attorney with Paul and Paul Law Office in Philadelphia.

Zale is a member of the Philadelphia Patent Law Association, the Philadelphia Bar Association, and the New Jersey Bar Association. He and his wife, Lisa, have one daughter and live in Schenectady, New York.

## 1982

Mark B. Baretella, M.D., is a second year fellow in invasive cardiology at The Cleveland Clinic Foundation. Mark received his M.D. degree from Rutgers Medical School in 1986 and completed a three year residency in internal medicine at St. Barnabas Medical Center, New Jersey in 1989.

Maryann Dorman married Thomas Kuren of Swoyersville. Maryann is employed as a medical technologist at Nesbitt Memorial Hospital. They now live in Larksville.

## 1983

Daniel Batzel received his Ph.D. in main group synthesis at Case Western Reserve University and now works for Dow Chemical Company. His wife, Jung Min, gave birth to a son, Grant, on January 19. They live in Midland, Michigan.

Dr. Linda K. Blose is board certified in internal medicine. She owns her own practice in Bath, Pennsylvania.

Catherine E. Lee is working for the Family Survival Project in San Francisco and studying full-time toward a Ph.D. in clinical psychology/neuropsychology at California School of Professional Psychology. She did master's work in gerontology at USC Leonard Davis School of Gerontology.

Captain Scott T. Lefebvre and his wife, Lori, announce the birth of a son, Shayne Maxwell, in September, 1989. They reside in Seffner, Florida.

Richard Petrella, M.D., a cardiologist, performed the first directional coronary atherectomy to be done outside a research center at Hanes Medical Center in Erie, Pennsylvania. The procedure removes fatty deposits from clogged coronary arteries with a rapidly spinning nail-sized shaver. Dr. Petrella, a lieutenant commander in the Naval Reserve, joined the Hanes staff in July.

Mary Hyde Pfister and her husband, Doug, announce the birth of a daughter, Erin Moiria, in January. They reside in Livingstone, New Jersey.

Judy Marie Rydzewski married Joseph David Cudo of Taylor, Pennsylvania. Judy is a senior programmer analyst with C-TEC Corporation of Dallas, Pennsylvania. The couple resides in Kingston, Pennsylvania.

Maureen Stanks Shaut has been appointed dean of admissions and students for the Munsun-Williams-Procutor School of Art in Union, New York.



### Beierle '78 heads home health firm

Kathleen J. Beierle-Zaccone has recently become sole owner of Medical Home Care Corporation and Medical Home Care Affiliates, which employs 100 people in Luzerne, Lackawanna, Monroe and surrounding counties.

A 1978 Wilkes graduate with a degree in nursing, Beierle-Zaccone has been involved in the home health field for nearly a decade. She became president of Medical Home Care Corporation in Wilkes-Barre in 1983. That corporation received Medicare/Medicaid certification from the Commonwealth of Pennsylvania in 1984. Two years later, in 1986, she became president of Medical Home Care Affiliates, headquartered in East Stroudsburg.

She is married and has two daughters.

**Siena J. L. Shields, M.D.**, is a board certified general practitioner and has opened her office in Conway, South Carolina.

**Elaine Kerchusky Tucker** and her husband, John, announce the birth of a son, Joshua, in December 1990. They reside in Millford, Pennsylvania.

**Kenneth R. Ustynowski, M.D.**, presented a lecture on colon and rectal cancer to the residents, faculty and staff of Wyoming Valley Family Practice located in Kingston, Pennsylvania.

**Ellen M. Van Riper** is an associate attorney specializing in land use and environmental law and municipal representation with the Jordan Law Firm in Phoenix, Arizona. She resides in Phoenix, Arizona.

## 1984

**Karen Bove** has been named assistant coach of the Wilkes women's basketball team. She is currently ranked 10th on the Wilkes all-time scoring list with 673 points.

**Christine M. Cummings** married John Bartosiewicz on April 28, 1990. Christine is a registered nurse at Fair Oaks Hospital, Virginia.

**Edward W. Czeck** married Kathy Nitzberg in September, 1990. Edward is an assistant professor at Northeastern University, Boston, Massachusetts.

**Joanne Dal Sasso** announces her engagement to Steven Ogden. An October 1991 wedding is being planned. She is employed at EG&G Judson as an ad-

ministrative assistant in sales and also editor of the corporate newsletter. Joanne resides in Quakertown, Pennsylvania.

**Sharon Fidishun** married Tom Goetz in October, 1990. Sharon is an account executive at AT&T. They are residing in Reston, Virginia.

**Frederic James Krome** is a graduate student at the University of Cincinnati, where he was chosen as a Charles Phelps Taft Dissertation Fellow. He is writing his dissertation on Anglo-American Film Propaganda in World War II.

**Robert Mehal** has been commissioned an Ensign in the United States Navy. He joined the Navy in August of 1984.

**Leo E. Orlandini** has assumed the position of quality assurance manager with The Lion brewery in Wilkes-Barre. He resides in Dallas, Pennsylvania.

**Donna Eshelman Yankovich** recently received an Award of Merit and publication of poetry from Iliad Press. She is pursuing publication of other poetry collections and scripts. She and her husband, John, and three sons, Kyle, Corey and Brett, live in Kingston. John is superintendent of maintenance for CertainTeed Corporation in Mountaintop.

## 1985

**Karen Anderson** married Troy W. Schulz on August 25, 1990. Karen is an applications project specialist for New York Life Insurance Co. in Clinton Township, New Jersey. They reside in Forks Township, Pennsylvania.

**Tawny Lynne Rushoe Dietrick** and her husband, Mark, announce the birth of a daughter, Erin Nicole, on December 10, 1990. They reside in Trout Run, Pennsylvania.

**Jane A. Kaynock** has received the 1990 Distinguished Leadership Award from the National Association for Community Leadership. She is a 1989 graduate of Leadership Hazelton.

**William J. Krawitz** was named production manager at Tamm's Industries. His wife, **Jeanne Norcross '76**, is a registered nurse on the addiction unit of First Hospital of Wyoming Valley. They reside in Edwardsville.

**James J. Mulligan, CPA**, has been promoted to controller for Elan International, Inc., a world-wide manufacturer of aromatic chemicals and vanilla extract. He lives in Hackensack, NJ.

## 1986

**Russell Banta III** married **Lisa Anne Sigman '88**. He is a quality control technician for Wyoming Sand & Stone in Tunkhannock. She is a statistical analyst for Guard Insurance Group, Wilkes-Barre.

**Lisa Marie DeCinti** was married to Brian Murphy. Lisa is employed with Liberty Mutual Insurance. The couple resides in Dover, New Hampshire.

**Jane Eyerman-Greto** and her husband, Michael, announce the birth of twin boys, Matthew Paul and Bryan Anthony, on Oct. 21, 1990. The family resides in Northampton, Pennsylvania.

**Michele James** was promoted by M-K Ferguson Oak Ridge Company and she was transferred to Oak Ridge Nuclear Laboratory Y-12 Site. She resides in West Knoxville, Tennessee.

**Steven M. Kotch** married Susan A. Michalek. Steven is an accounts representative for General Motors Acceptance Corp. They will live in Nanticoke.

**Kimberly R. Land** graduated from Temple University School of Dentistry in May, 1990, with a D.M.D. degree. She is practicing family dentistry in Minersville.

**Christine L. May** formed a student association for Wilkes's master's in health care administration program and serves as president. Christine is employed at St. Lukes Hospital, Bethlehem.

**John P. Cusatis** graduated from Millersville University with a master of arts degree in English.

**Paul Middleton** married Margaret Fino of Ashley. Paul is a Wilkes-Barre City police officer. He is also a member of the United States Marine Corps reserves and served in the Persian Gulf.

**Alison Adair Geise** married Stephen Leonard Wagner. Alison is employed by J.C. Penney Telemarketing. They will reside in Moosic, Pennsylvania.

**David Paul Machina** married Cynthia Ann Shattkoski '87. Paul is a computer programmer at Markdata in Pittston. Cynthia is an accountant at Franklin First Federal Savings Bank in Wilkes-Barre, Pennsylvania.

**Thomas and Andrea Hincken Mosca '84** announce the birth of a daughter, Hillary Elizabeth, in July, 1990. Tom graduated from Columbus School of Law-Catholic University and works at Shea, Shea & Caputo. Andrea is a customer service representative at ECW Insurance Agency, Wilkes-Barre.



The Admissions Office Invites

## All Alumni

to participate in the newly formed  
Alumni in Admissions Program

Members of the program will be asked to participate  
in some of the following activities:

- \*college night programs.
- \*visits to prospective students' homes.
- \*receptions for accepted students.
- \*phone calls to accepted students.

If you would like to assist the Admissions Office in  
their recruitment efforts, please contact  
the Dean of Admissions,

at 717-824-9890 (local),  
800-572-4444 (from Pennsylvania),  
or 800-537-4444 (from outside Pennsylvania),  
extension 4403.

## Marquart '88, Yencha '85 serve in Gulf

Two Wilkes graduates made headlines and front lines during the Gulf War last winter. Debbie Marquart '88 was the subject of news releases about her supervision of making bombs. Dr. Myron Yencha '85, who served as a battle surgeon, accompanied the front-line troops into Kuwait.

Interviewed by pool reporters at "an airbase in the Arabian Peninsula," Marquart talked about her work supervising five squadrons of men building bombs. She supervised crews for munitions, fabrications, maintenance, armament systems and aerospace ground equipment. Part of her daily routine was a three-hour inspection of bombs for defects.

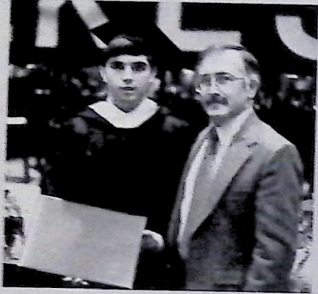
Marquart, who graduated from Aircraft Maintenance School only three months before arriving in Saudi Arabia, is a 1988 Wilkes graduate who majored in mathematics. She was also an ROTC cadet at Wilkes.

Yencha, a 1985 graduate who earned his M.D. degree from Temple University School of Medicine in 1989, served as a battalion surgeon during Operation Desert Shield/Desert Storm. As a battalion surgeon, Yencha was responsible for the health care of 1,000 marines and supervised 65 corpsmen.

"Since I was a battalion surgeon, I was located on the front lines and did everything the battalion did," Yencha wrote. "During the ground war, I crossed into Kuwait with the lead elements of the assault and could hear artillery whistling over my head. I did have some incoming go off near me. Although the battalion didn't take casualties, I did treat several Iraqi EPW's."

Yencha returned to the United States in April.

Gowers are 3-generation Wilkes family



When Edward J. Gower II graduated in spring of 1990, his family became one of Wilkes University's elite three-generation families. His dad, Edward J. Gower '70, and grandfather, Kenneth N. Gower '53, are also Wilkes graduates. The elder Mr. Gower was unable to attend young Gower's Commencement.

Yvonne Kay Pierman announces her engagement to Louis Zampetti. They will be married in June, 1991. She resides in Lambertville, New Jersey.

Jon Witkowski married Beverly Thomas of Clearwater, Florida. Jon is sales coordinator for Ring Rent, Ringhaven Equipment Company, Tampa, Florida.

1988

William M. Davidson and Amy Rosemergy '89 were married in September, 1991.

Margaret Harrison married Ralph J. Nardone from Pimton. Margaret is a computer operator with the Old Forge Bank.

Thomas R. Laurita married Susan G. Marino '88 in October, 1990. Thomas is an accountant with Prudential Asset Management Company in Monaca, Pennsylvania. The Laurita's reside in Wilkes-Barre.

Thomas H. Meyer is a counselor/therapist with the Eckerd Foundation, working with troubled juveniles in an outdoor residential setting. He resides in Exeter, Rhode Island.

Robin Paisley recently joined the staff at the F.M. Kirby Center for the Performing Arts as marketing director.

Stephanie L. Stine announces her engagement to Salvatore P. DiGiovanni '89. Stephanie is employed at Lehigh Valley Hospital Center as a registered nurse in the operating room. Sal is employed as the assistant programmer for Canine Caterers of West Chester, Pennsylvania.

Edward J. Sullivan, P.E., has received his professional engineer's license. Ed is a senior electrical engineer in the electrical utility department of Quad Three Group, Inc., of Wilkes Barre. He and his wife, Susan, live in Larksville.

Leonard F. Witzak is employed with Magic Years Child Care Centers in Plains, Pennsylvania. He works as a district manager of eight child care centers in the Wilkes Barre/Scranton area and in Binghamton, New York.

1989

Kevin Gaffey has been promoted to a staff level II accountant by Green and Company, Wyalitbridge, New Jersey. Kevin resides in Edison, New Jersey.

Andrew K. Harris is an electrical engineer with Westinghouse Savannah River Company. He resides in Augusta, Georgia.

Wendy Sue Henning married Jon Howton. Wendy is a medical technologist for the American Red Cross in Wilkes-Barre. Jon works as a service technician for Mediscus Corporation in Wilkes-Barre.

John B. Schmidt completed Army basic training and joined the 101st Airborne Division. He has been stationed in Saudi Arabia and hopes to finish flight school when he returns home.

1990

David M. Argentati has been named men's assistant basketball coach at College Misericordia in Dallas, Pennsylvania.

Christopher Buchanan is serving as an intern in the City Clerk's Office at Wilkes-Barre City Hall.

Lisa Isbitski Golden is a staff nurse in the medical surgical telemetry unit at Geisinger Wyoming Valley Medical Center. Lisa and her husband, Michael, live in Wilkes-Barre.

Lori Trombetta has passed her State Board Examination and is employed in the Chemotherapy Unit of Nesbitt Memorial Hospital, Kingston.

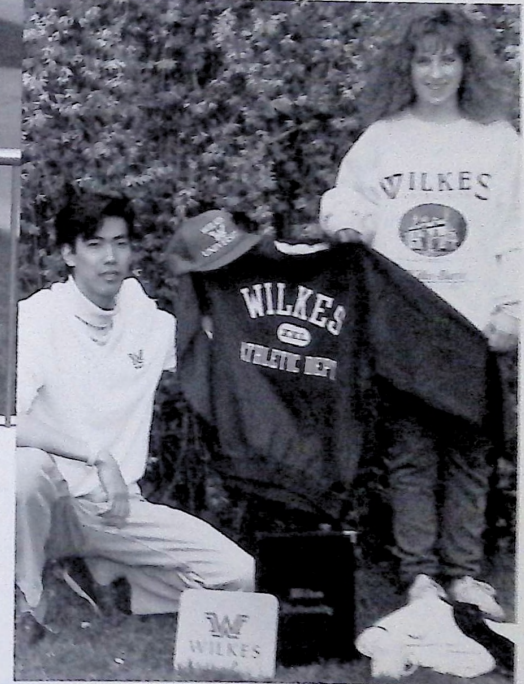
Carolee Welebob was hired by the Crestwood School District and will teach seventh grade mathematics at Fairview Elementary, Mountaintop.

IN MEMORIAM

- Gerald P. Bush '49
- John C. Gigger '41
- Matthew Paul Hughes '73
- Thomas Krusalevich '62
- Merrill Parrell Harrison '68
- Mark Schinderman '86



Gifts for the Grad from the Wilkes University Bookstore



Meet the models

Gail Humphrey is a junior political science major from West Pittston. Peter Chu, a senior computer information systems major, is a graduate of the High School Art & Design in New York City.

Ordering Information

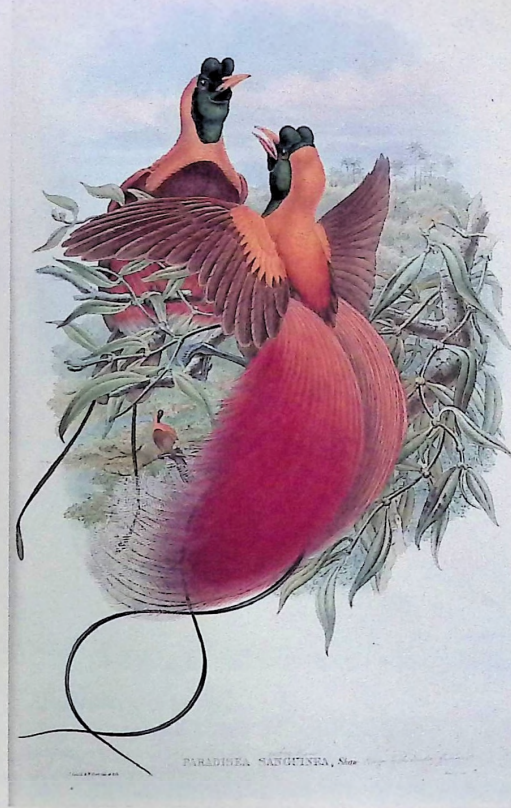
Cap, royal blue with white puff print. One size fits all.	\$5.95
Mouse Pad, approx. 8 x 9.5 in. Gray with blue imprint.	7.95
Pad Holder, High quality textured vinyl, gold imprint. Burgundy, black or brown. Specify color.	9.50
Ceramic Mug, ecru with royal blue imprint.	3.75
Towel Set, bath & wash cloth, white with navy/gold embroidery.	15.00
Gear Athletic Department crewneck sweatshirt, Navy with white or white with royal. Unisex sizes: M, L, XL.	30.95
Tie, 70% poly, 30% silk, navy with gold stripes & crest.	9.00
Gene crewneck, sweatshirt, natural with leather gray yoke, Weckesser Hall on front. Unisex: M, L, XL.	30.95
Golf Sweater, 100% soft virgin acrylic, white with navy embroidery. Unisex: M, L, XL.	37.95

Order Form					Shipping & Billing Information													
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Lilium, Christopher Trew, ca. 1750-1773

While Wilkes student scientists prepare for the high-tech world, symbolized on the front cover by a student-made transistor constructed in the microelectronics laboratory, the scientific basics have not been left behind. These works of art from the Charles B. Reif Collection of Natural History Prints are a reminder that even as biologists prepare for the fields of molecular biology and molecular genetics "we take pride in teaching our students to understand natural history — the organism in its habitat; anatomical and genetic adaptation — the information needed by the Renaissance person."



Paradisea sanguinea, J. Gould and W. Hart, ca. 1875-1888

**Wilkes University Quarterly**

Wilkes University  
 Wilkes-Barre, PA 18766  
 ADDRESS CORRECTION REQUESTED

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