State Senator Michael O’Pake presented a check for $20,000 in state grant funding to Albright for a new initiative to assess and potentially improve forensic services for Berks County law enforcement agencies. The grant was awarded from the Pennsylvania Department of Community and Economic Development with the assistance of Senator O’Pake.

The state grant is being used to study and assess the state of forensic services provided to local law enforcement agencies in the county and to develop a strategic plan to address any deficiencies. Albright will also use funds to create courses in the forensic sciences.

Albright is working in partnership with the Center for Community Leadership (CCL), which is housed at Albright and sponsored by the Higher Education Council of Berks County. In the area of law enforcement, CCL has been holding municipal roundtable discussions on police information-sharing in the county and planning a countywide conference on crime.

A key component of the project is the creation of a Forensics Community Advisory Committee. The committee, chaired by Andrea Chapdelaine, Ph.D., acting vice president of academic affairs, includes College officials, Berks County criminal justice officials and other local and state officials. The group is working to assess the current state of forensics and will develop a plan to address any deficiencies.

An academic committee, led by Christian Hamann, Ph.D., assistant professor of chemistry and biochemistry, is currently working to address campus needs including student requests and curriculum requirements. The group also oversees the development of new courses, ensures the proper integration of new courses with existing programs, investigates related offerings at peer institutions and leading national programs.

Albright Receives Grant... continued inside
2005 SENIOR
THESIS TOPICS

Homing Ability, Road Crossing
Behavior and Population Dynamics
of White-Footed Mice
Adrian Chesh &
Stephen G. Mech, Ph.D.

The Transmission Properties of
Light through a Photonic Bandgap
Fiber
Adam Forrer &
Brian J. Buerke, Ph.D.

An Immunological Investigation
of Antibacterial Antibodies
in Chicken Egg Yolks
from Various Sources
Kate Hodge &
Gerald L. Kreider, Ph.D.

The Identification and
Sequencing of the Glutamate
Decarboxylase Gene in
Mutant vs. Wild Type Tobacco
Rebecca Miller &
Andrew I. Samuelsen, Ph.D.

The Use of 16S rDNA Sequences
to Identify Bacterial Species
Living in Selwyn Pond and
Antietam Lake
Heather Miller &
Gerald L. Kreider, Ph.D.

Controlling Factors of Plant
Distribution of a Newly Developing
Wetland: Implications for
Plant Invasion and Restoration
Marissa Moyer &
David T. Osgood, Ph.D.

The Ultrastructure and
Histology of Pancreatic Beta Cells
in NOD Mice
Jacqueline Tome &
Richard G. Heller, Ph.D.

Low Volume Human Blood Cell
Culture and Karyotyping
Lauressa Werst &
Andrew I. Samuelsen, Ph.D.

A Sneak Peek at Albright’s
New Science Center

In previous issues of Fusion we’ve
talked about Albright’s need for a
state-of-the-art Science Center to
replace our beloved, but aging, Science
Hall. Albright alumni will be hearing
more about the project in the future,
but we wanted Fusion readers to be
among the first to have a sneak peek
at an architect’s rendering of the
planned 86,913-square-foot building.

The innovative design of the
building will support interdisciplinary
teaching and learning of science,
faculty collaborative research, and
the exchange of ideas, information
and instrumentation among scientific
disciplines.

The Science Center, designed by
Lord, Aeck and Sargent of Atlanta, Ga.,
will be located along 13th Street in
front of the Administration building,
and will link to Memorial Chapel.

“The new Science Center is a major
priority for the College. Not only
will it house the sciences, it will free
up much needed space for other
programs, classes and offices,” said
President Lex McMillan. “We are excit-
ed that we are beginning to make the
transition from concept to reality, and
although it will be a few years before
the building is completed, we want
our science grads to begin to share in
the excitement.”

Albright Receives Grant...

solicits ideas from faculty for forensic
studies that make use of Albright’s
unique interdisciplinary program, works
with Career Development on intern-
ship and career options and prepares
materials for the Admission Office to
recruit new students.

Three new classes have already been
developed as part of the forensics
initiative: “Introduction to Forensic
Science,” “Criminal Investigations” and
“Advanced Criminal Investigations.”
The “Introduction to Forensic Science”
course, developed by Phil Dougherty,
Ph.D. and offered for the first time this
fall, is already filled, Hamann said. “And
students are already requesting that this
be offered again in the spring.”
A Passion for Teaching

Todd Trout ‘84, a chemistry teacher at Lancaster Country Day School in Lancaster, Pa., served as a mentor for the U.S. Chemistry Olympiad team in 2003 and 2004.

“...‘the guide on the side,’...”

– Todd Trout ‘84

Teaching 10th, 11th and 12th grade students, he says he tries to emulate the teaching methods that made an impact on him when he was a student. “I’m sort of ‘the guide on the side,’” he says. “It’s important to allow them (students) independence, let them be active participants, figure out how to solve problems in a lab setting, develop their own skills and answer questions themselves.”

Developing a personal relationship is also a key component. “When I was a student at Albright, I felt fortunate to develop personal relationships with many of my teachers. I think excellent teaching at any level requires a personal connection between the teacher and the student,” he says.

Those personal relationships and the desire to work with exceptional students are what prompted Trout to apply to be a mentor for the U.S. National Chemistry Olympiad. In 2002, he was selected to serve a three-year term.

From approximately 13,000 high school students, 20 are selected to comprise the U.S. Chemistry Olympiad team. These students spend two weeks during June at the U.S. Air Force Academy, in Colorado Springs, Colo., where they intensely study advanced topics in chemistry under the direction of Olympiad mentors and faculty of the Air Force Academy. At the end of the two-week camp, the top four students are chosen to compete in the International Chemistry Olympiad (IChO).

Trout, whose job it was to structure the two-week camp, says, “The students are mailed an organic chemistry text and told to read chapters 1–10 and have the problems done before they come to camp. That's a whole semester of organic chemistry! These kids are just off the charts!”

Having competed in Athens, Greece in 2003 and Kiel, Germany in 2004, Trout says the U.S. team always performed well. “Each year, every student who traveled to the international conference received a bronze, silver or gold medal,” he says. “But I don’t think you measure success by medals. You measure success by the experiences everyone had. It’s great to do well, but for some students it’s a life-changing experience.”
Ready to pounce on his prey, the tiger readied himself to move in as Sarah Sutcliffe ’05 quietly looked on. With one strong swat of his clawed paw, he dragged his prey into the water, sparing no time before tearing it apart, limb by limb, until it was lifeless. And then the crowd cheered.

While it sounds grisly, Sutcliffe quickly points out that the tiger’s “prey” was just a stuffed toy scented with meat to get his animal instincts to kick in; part of the enrichment process at the Utica Zoo in New York where Sutcliffe interned last summer. Enrichment is an important part of zookeeping, she says. It’s used to enhance the psychological well-being of the animals. “By giving them things to ‘kill’ it brings out their natural behavior,” she says.

Human interaction is also an important part of animal training. From grooming and offering new foods or scents, to providing unfamiliar objects such as toys, brushes or mop heads, this kind of enrichment provides the animals with variety, new experiences and opportunities to explore. One of her projects, she says, was making a wooden antelope to put in the camel’s enclosure. “He was afraid of it at first,” she says, “but then he was attracted to the leaves we put on it.”

Having just completed a second animal care internship at the Philadelphia Zoo, Sutcliffe says she’s been an animal lover since she was very young. “I’ve always been a Jack Hanna Animal Adventures watcher,” she says. One night while watching The Tonight Show, the biology/French major was captivated by an orangutan on the screen. “I knew at that moment that’s what I wanted to do. I wanted to train animals,” she says.

At the Utica Zoo, a much smaller zoo than Philadelphia’s, Sutcliffe’s responsibilities stretched across the park from the smallest to the fiercest animals. Spending two weeks in each section of the zoo, Sutcliffe worked alongside the zookeepers doing training, enrichment and daily maintenance of the exhibits, as well as learning how to handle the animals and about safety protocol. “I learned a lot, especially about protocol,” she says. “You have to make sure that certain doors are closed when you go in the enclosures. You need to make sure it’s safe for both you and the visitors. Working with tigers and bears you just have to keep on top of things.”

Working within the Children’s Zoo in Philadelphia was a little more tame, says Sutcliffe. She attended to parrots, raptors, hedgehogs, porcupines, rabbits, cows, chickens, pigs, ferrets, ducks and reptiles by preparing and distributing food, maintaining the exhibits/enclosures, keeping animal health and behavior records, administering medication, assisting with animal capture, crating and transfer, and conducting enrichment and training.

But while the animals in Philadelphia’s zoo presented less of a challenge, the visitors kept her on her toes. “I definitely learned that you can’t be a zookeeper if you can’t also handle people,” she says. In the Children’s Zoo it’s common to have to ask visitors to stop chasing or harassing an animal. “They’re kids,” Sutcliffe says. But, “you get very attached to the animals. When someone is harassing them you just want to say, ‘Don’t hurt my baby!’”

Having just graduated, Sutcliffe is hoping to land a job as a zookeeper at the Rio Grande Zoo in her home state of New Mexico.

“It’s one thing to learn about animal behavior in the classroom,” she says. “But it’s a totally different experience to see it. Zoos really can be places where animals can act naturally.”
Ryan Lutz ’04 last year. Hamann received a Summer Undergraduate Research Fellowship from Merck & Co. that helped fund the research, along with the ACRE grant.

The purpose of the project, was to synthesize a compound called Ambrox from a natural product, abietic acid. Natural products are chemicals isolated from plants and animals that may be used as advanced intermediates in chemical synthesis. They are also commonly found in a variety of commercial products, such as lemon and orange oils used in cleaners and medicinal ingredients camphor and menthol. Willman said they were looking for cheaper and easier methods of synthesizing Ambrox. The current process the industry uses to synthesize this compound is very expensive.

Willman spent 10 weeks last summer conducting research before working on the project over Interim. The project focused on synthetic organic chemistry, an area Willman said he plans to focus on in graduate school.

At the end of Interim, Willman had not yet synthesized the target molecule, but said that he plans to continue the project during his senior year as a Senior Thesis. He presented his project at the National Conference for Undergraduate Research in April 2005, and will also make a presentation at the National Organic Symposium this summer.

Other Interim 2005 ACRE projects in the sciences included:

Adam Forrer ’05 (Brian Buerke, Ph.D., assistant professor of physics) “Transmission Properties of Light Through an Optical Fiber”

Quintina Herrera ’05 (Frieda Texter, Ph.D., professor and chair of chemistry and biochemistry) “Urea-induced Unfolding of Arylamine NAT Followed by CD Spectroscopy”

John Touhill ’05 (Texter) “Thermal Denaturation of Recombinant NAT 2 by CD Spectroscopy.”

During Interim 2005, five Albright students conducted scientific research made possible through Albright Creative Research Experience (ACRE) grants.

Bethany Adams ’06 worked with Brian Buerke, Ph.D., assistant professor of physics, on “Optical Tweezers: Grasping Matter with Light.” Buerke said, “The goal of the project was to build a functional optical tweezers apparatus to become a permanent addition to the laboratory to be used for demonstrative purposes in the introductory optics courses and for laboratory research in the advanced courses.”

As he explained, optical tweezers are really not tweezers at all. It is a high-powered laser that is focused down into a concentrated beam. When this beam passes through a small transparent particle, the particle becomes trapped in the beam. The trapping occurs because the light carries momentum and gives a kick to the object when the light’s path is bent. These kicks prevent the object (like a cell) from leaving the beam. When the particle is trapped, it can be rotated and moved within the system in which it is contained. Due to the microscopic size of the particles used in this system, a lens system is in place to magnify the particles onto a live feed camera. The images are then displayed on a computer screen.

Adams conducted preliminary research in the fall, and the apparatus design was finalized in early January. The apparatus is now built and preliminary testing has been done. However, it is not fully functional yet, Buerke said. The testing revealed that the lens system is not producing a high enough magnification to see the particles clearly enough to capture them. Research with optical tweezers will continue over the summer when Buerke works with ACRE grant recipient Darren Stoltzfus ’06 on “Application of Optical Tweezers to Undergraduate Education.”

Based in part on her Interim ACRE project, Adams was offered an internship this summer at the University of Maryland, where she will be doing her own research project.

Gary Willman Jr. ‘06 worked with Christian Hamann, Ph.D., assistant professor of chemistry and biochemistry, on “Synthesis of Ambrox from Chinese Pine Rosin.” Hamann and professor emeritus Robert Rapp collaborated on this project for several years, working with recent Albright graduate
Q & A WITH...
DONALD L. DANIEL, PH.D.,
PROFESSOR OF BIOLOGY

How long have you been teaching at Albright?

“I started in September 1964 and will have been teaching for 41 years in September 2005.”

What has changed in that time period?

“I came here out of a research institution and Dr. Masters looked at me and said, ‘This is a teaching institution. That’s what I want you to do.’ At that time, the science department was known to be a ‘pre-med’ department. We would take in about 140 students per year in biology. Back then, we had two professors in chemistry, and they taught general chemistry. On the first day of class, they would look at the students and say, ‘Shake hands with the person next to you.’ Then they would say, ‘By the end of your sophomore year, one of you will not be here.’ I’m told now that’s intimidating and you don’t do that anymore. But the point was, that was reality then.”

Have there been many changes in the curriculum?

“One of the things I wonder if people realize is that at one time, you had to have 122 credit hours to graduate. As a result, most courses, excluding science courses, which have a lab component, were three-hour courses. If you take off two hours for phys ed, which no longer exists, so that you have 120 hours and divide by three, that’s 40 courses. Current students need 32 courses to graduate [four-hour courses for a total of 128 hours]. Back when I first started at Albright...students had to have 120 hours of courses when they left, but we put out one good product if those science students survived it.”

What experiences and memories stand out?

“There are three individuals who I had the pleasure of introducing when they received honorary degrees from the College.

Dr. Philip Sharp received a Nobel Prize. He was a parent of an Albright student at the time he received it. Since then, I think we have had one Nobel Prize winner from our campus. He stays in my mind because I had his daughter, Sarah, in class. It was in November, I believe, during her first semester, and Sarah came up to me and said, ‘My dad got the Nobel Prize last night.’ I really thought she was pulling my leg. But he got it. He received his Nobel Prize for his work in DNA and viral work in November 1993 on work published back in 1977. Albright gave him an honorary degree in 1996, when his daughter was graduating, so he gave the Commencement address. I had the honor of introducing him.

Another memorable person, who is kind of a unique chap, is Durland Fish. He graduated in biology/chemistry in 1966, and he too received an honorary degree in 2002. Durland has done a lot of work with West Nile Virus. He’s an epidemiologist, looking into the spread of diseases. He works with insects due to his background in entomology, and so obviously he was able to look at the mosquito’s involvement in the West Nile situation. It was fascinating; the week after he got his honorary degree here, if I remember correctly, he went to Yale and became a full professor. That’s pretty tops for an Albright graduate.

A final person that sticks out in my memory is Heidi Devlin. Heidi was unique. She earned an associate’s degree from Reading Area Community College in 1992, a bachelor’s degree from Albright in 1995, and her Ph.D. from Hershey in 2004.

I met Heidi at RACC when I taught evenings there. By the end of the semester, she looked at me and said, ‘You know, I’d like to do cancer research.’ I swallowed hard and said, ‘You know what that means? A Ph.D.’ She said, ‘Yes.’
IN THE WORKS...
TROPICAL ECOLOGY & CONSERVATION FIELD COURSE

During summer 2004, David Osgood, Ph.D., associate professor of biology, and Nick Lambros ’05 traveled with a Penn State-Berks Lehigh Valley biology class to Peru, South America to research the potential for a tropical ecology and conservation field course to be offered to Albright students in summer 2006.

While the Penn State course involved travel to several different areas, Osgood says that based on his observations, the focus of the Albright course will be solely on the Amazonia region, allowing students more time to delve into individual research projects.

The course will have a 10-day on-site component. Prior to the trip, students will have lectures on tropical ecology and will study Peruvian culture and history. They will also develop an individual project to be further researched on-site. Individual projects will cover areas such as: single species studies, forest canopy studies, ecotourism & local culture, the Community Reserve Model, agricultural activity & resource extraction, and GIS mapping.

Upon arriving in Peru, students will have five days to acquaint themselves through regular daily excursions. They will then conduct their individual research projects and present the findings upon returning to Albright.

Have you been involved with any research projects recently?

“No. My research was mainly in reproductive physiology, endocrinology, and the chemistry thereof. That’s what I worked with at Ohio State, mainly working with large animals like sheep. The new Science Center is going to have an animal housing facility, so we will have the ability to handle that type of research on small animals.” [Work in the neurosciences will also be possible in the new Science Center.]

What is your favorite part of your job?

“Teaching young minds. Period. No further.”

What is the most rewarding part of your job?

“To see a concept catch. You lay out a multitude of little things in teaching, but what you’re really trying to do is put a concept together. In fact, somebody sat here the other night and as we were going over a topic, he said, ‘You mean that this and this and this are all related?!’ All of a sudden, the concept had come through for that student. That made my day. I had made my point.”

What has kept you at Albright for all these years?

“The rewards of teaching students eager to learn. It’s pretty hard sometimes since some of the non-majors just want to get through the course. They just want a grade that will pass them but in my course, they are going to have to work for it. And I don’t apologize for that. Most people are willing to learn, even if it is not their area.”

What words of wisdom do you impart on students?

“There are two quotes that I impart to my students. One comes from Charles T. Spraling: ‘Knowledge consists in understanding the evidence that establishes the fact, not in the belief that it is a fact.’ The other is from Einstein, ‘No amount of experimentation can ever prove me right; a single experimentation can prove me wrong.’ These two go together well.”

Do you see retirement in the near future?

“Yes, it is going through my mind. I’m getting there.”

INSTITUTE

Q) What does the abducens nerve do?
A) Contracts the lateral rectus (abducts the eye)

Bonus:
Q) Which cranial nerve is it?
A) 6th cranial nerve

Q) Which cells secrete insulin?
A) The beta cells in the Islets of Langerhans in the pancreas

answers... continued from back page
Time to brush up on your knowledge of physics. The first 10 readers to submit the correct answers to the following questions will receive an ultimately cool Albright cooler bag! Answers will be provided in the fall 2005 issue.

1) If the universe were shrunk so that the sun is the size of a basketball, how far away would the nearest star be?

2) Of the nine known planets in our solar system, which one is farthest from the sun?

3) The word LASER is an acronym. What do the letters stand for?

4) If white light shines through a red filter, red light will come out the other side. What color of light comes out if white light shines through first a red filter and then a blue filter?

5) How many states of matter are there? (Hint: It’s more than three.)

6) What is Archimedes’ principle?

E-mail your answers to jstoudt@alb.edu or send them to Jennifer Stoudt, Albright College, 13th & Bern Streets, Reading, PA 19612-5234. You can also submit answers via the Albright web site: http://www.albright.edu/fusion/index.html

Congratulations to the following winners of the winter 2005 Brain Teasers:

Georgann (Fisher) Connell ’79
Joy (Salzmann) Davis ’81
Leanne (Fuhs) DeBlieu ’87
Jodi Kaufman, M.D. ’83
Matthew J. Pizzo ’97
Elaine (Stallone) Ruppert ’87
Eric J. Share ’88
April (Hitchcock) Tuscher ’79
Bob Willard ’91
Tom Work ’92

Here are the correct answers:

Q) Where is the incus located?
A) In the middle ear

Q) What does the Loop of Henle do?
A) Concentrates the urine by recovering water and NaCl

Q) What causes the “lub dub” sounds of the heartbeat?
A) The closing of the heart valves

Q) Where are the cells in the body that monitor body temperature?
A) Hypothalamus

answers... continued on inside back page