



Insights

Winter 1996

College of Science

Alumni Newsletter

Vol. 5 Issue 1

MacMahon's Musings

As December begins, I am gearing up for what I hope will be the final interactions with the Utah

Legislature to obtain funding for the new Widtsoe Hall. A few weeks ago, we made a request to the State Building Board for nearly \$27 million. We are "on the bubble" with regard to their priority list: Widtsoe was ranked #6 and the five projects ahead of us could consume all of the capital funds that will be allocated this year. Obviously, we hope that will not be the case, but all of us, including you, our loyal alumni, need to help. If you know your local Utah legislators, tell them how important this project is to USU and the State and that you would appreciate their support in the upcoming legislative session that commences in mid-January and goes until early March.

Plans for the new building, as well as the Learning Center to be built as part of the same complex, are moving forward at a rapid rate. The designs are spectacular and I am very excited about this project. Currently, we are attempting to find \$4 million to match a \$3 million gift to build the Learning Center. If you know any good prospects for a significant gift let me know.

On a completely different topic, we have again had increases in the number of students on the main campus. Our preliminary figures suggest several hundred more students. Those of you who have not been on campus for a few years should visit some weekday at 20 minutes past the hour when classes are changing. There are human traffic jams on all the walks near major buildings. This is a far cry from the quiet university I first visited 26 years ago.

Finally, you would be very pleased with the faculty if you could see them at work the



Dean James A.
MacMahon

College Alumna Wins National Science Award

You cannot buy your way into a tour of the State Department Building's top floor in Washington, D.C. You have to earn your entrance into these elegant rooms usually reserved for kings, queens, and other dignitaries, and that's just what Cathy Ewart Welch, a fifth and sixth grade science teacher in Hooper, Utah, did. By winning the Presidential Award for Excellence in Science and Mathematics Teaching, Welch was nationally recognized and treated to a VIP stay in the nation's capital.

The award committees found in Welch the perfect blend of extracurricular, classroom, and educational experience. Before doing graduate work at USU, Welch received BS and MS degrees in biology from the University of Missouri, Kansas City, and later another BS degree in elementary education from

Weber State University. Welch has taught for eleven years, currently at Country View Elementary School in Hooper. In addition to teaching full-time, she also serves on the Board of the Ogden Nature Center and is the elementary school representative on the board of the Utah Science Teachers Association.

Her school activities have been creative as well as educational, and she has involved her classes and science clubs in many projects. One activity involved turning classrooms into tropical rain forests complete with pool, vegetation, and animals, such as birds and clay snakes, made by her students. Welch also helped build an outdoor nature study area with trees, shrubs, archeological sand pit, and butterfly arena. A life-sized blue whale was painted on the playground by Welch, other faculty, and students.

After receiving a letter from President Clinton informing her of the award last November, Welch was honored in Washington, D.C., on May 10, 1996. Three other Utah teachers were selected in the elementary math, secondary



From left to right: Dr. Neal Lane, Director, National Science Foundation; Ms. Suzanne Evans; Ms. Cathy Welch; Ms. Janet. Walter; Mr. Barry Bishop; and Dr. John Gibbons, Director, Office of Science and Technology Policy.

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Boharts Endow Insect Collection at Utah State University



George (Ned) E. and Adelaide Bohart

George E. (Ned) and Adelaide Bohart have established a \$50,000 endowment in the College of Science for the USU Insect Collection, with the intention of making the collection a more significant resource for faculty, students, and outside specialists. The insect collection is in good condition, but because of limited space, personnel, and funding, many of the insects are not able to be prepared and so are kept in storage conditions. The Bohart's generous gift will make the collection available for professional use. A traditional user of such a collection is the Agricultural Experiment Station at USU, where researchers study the balance of harmful and helpful insects and learn to control them. Right now, the main concern is to catalog the specimens and make information about them available on the Internet to students and specialists. The collection can aid insect identification and entomological study worldwide.

Ned's association with the collection is part of his lifelong interest in entomology. He received MS and PhD degrees in entomology from Berkeley before coming to Utah State in 1947. While at USU, Ned worked closely with faculty members Frank Parker, William P. Nye, George Knowlton, and Wilford Hanson to build the collection to its outstanding level—ten times what it was in 1947. Although officially retired, Ned continues to work on the collection almost daily.

Ned was born in Berkeley, California, where he remained until serving in the army during World War II. He was sent to North Carolina, where he met and married Adelaide Simmons. "It was a war-time affair," said Adelaide. The Boharts had three children: William, Catherine, and David. Adelaide worked as a secretary for the YMCA until her children were born. She still carries her soft southern accent, in spite of a half century in the West.

The collection, for those unfamiliar with it, is more than 100 years old, with some of the specimens dating back to 1895. One can catch a glimpse of the massive undertaking in Biology Natural Resources 240. This room is filled with rows of large cabinets

housing a vast array of prepared specimens. Although no one knows who officially started the collection, we know it was begun on behalf of agriculture studies being done at USU to help develop insects that would aid farmers. The collection of more than 2 million specimens from around the world concentrates mostly on Utah insects.

Down the hall, in room 230, is the "Oh My" Collection. "Oh my" or "wow" seem to be the most common responses heard while looking at the exotic insects collected from around the world. Some insects on display are the famous rhino beetles; walking sticks; fantastically colored butterflies and moths from New Guinea and Australia; and even the infamous Mormon cricket. The collection offers a great learning environment for children and is available to the public to view by appointment with Dr. Carol von Dohlen or Dr. Wilford Hanson at the Insect Collection, (801) 797-2554.

The College of Science thanks Dr. and Mrs. Bohart for establishing the Bohart Endowment.

Thank you, also, to William P. Nye for his recent, generous donation to the Bohart Endowment in honor of USU's Insect Collection.

MUSINGS

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last few months. They are busy gearing up for the transition to semesters, as well as the implementation of our new University Studies Program. While they are not finished, their early work shows their dedication to teaching and to making this an ever better place to receive an education. I am extremely proud of their hard work and you will be too when you see the final results.

Sincerely,

A thank you . . .

We are pleased to list our alumni and corporate and foundation benefactors for the 1995-96 fiscal year. Thank you for enhancing our science education programs at the University. Your support ensures that we can continue to improve the education of our students and provide new discoveries for the world's body of scientific knowledge. —James A. MacMahon, Dean

INDIVIDUALS

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Baha Alak
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Mary Lu Anderson
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Katherine Angelos
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Space—the Final Frontier

The heavens have intrigued people throughout history: Greek mythology is based in large part on the constellations, sun, and planets; much of Native American storytelling seeks to explain the earth's role in the celestial scheme; and Vincent van Gogh's *Starry Night* aptly portrays the emotional response of many people to the beautiful night sky. Mystery, romance, fortune telling, and science all find a home in the stars.

We might be hard pressed to explain why the skies hold such intrigue, yet none can deny the galaxy's power to excite. It is just such a power that draws our eyes upward on a clear night, seeking to find and name what bodies we do know: Venus, the Big Dipper, the North Star. Jill Marshall, physics and astronomy professor at USU, clearly comprehends the heavens' attraction—she deals with it on an almost daily basis, both in the

classroom and with the community. She teaches introductory astronomy classes and serves as a local expert on the stars. "Urban residents seldom see the stars because of glaring city lights, yet they have a fascination with the solar system," said Marshall.

To help satisfy our interest in the universe, the College of Science is raising funds to build a new observatory on campus. This facility will augment the university's physics courses, increase interest in general science and engineering courses, and will be a wonderful gathering place for the community to see the stars first hand. "Actually having an observatory is different than just looking at pictures or looking on the [Inter]net at what's going on in observatories around the world," said Marshall. "There's still nothing like looking through the glass yourself—moving the telescope and

seeing it. That's the only way you can really get the relationship between the image you're seeing and the sky."

The new building will replace the current, problem-plagued observatory. The present facility, only 15 feet in diameter, simply cannot accommodate USU's growing student population, let alone interested community members. "The observatory is so small it could fit in my office," said Marshall. "Often students don't believe it's an observatory at all because of the size." Besides its limited space, the building's dome has a broken motor and water leaks, the facility lacks heating and restrooms, and the exterior and surrounding grounds are in poor condition.

Plans for the new observatory include a large meeting room/planetarium where visitors can view images projected from the telescope; a computer room with connections to other observatories and astronomers working around the world; a display room for current science topics; and a 12-foot dome room, which will house the telescope. The building will also have restrooms and a patio on which portable telescopes can be placed. The new observatory will provide research opportunities for students as well as a gathering place for star gazers in the valley and beyond.

Observatory construction will begin when sufficient funds are raised. The college has received a challenge grant gift, an encouraging start toward the remaining goal of \$300,000. The building could be named after a major benefactor.

People in the College of Science are excited about the prospect of a new observatory and look forward to offering alumni, students, faculty, and the community a place to tantalize our deeply rooted fascination with the universe.

** For more information on the observatory, please call or write Katherine Angelos, Development Director, (801) 797-3510, College of Science, 4400 University Blvd, Logan UT 84322-4400.*

A THANK YOU, *continued*

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The College of Science honors graduates of the Class of

Golden Aggie

Noreen T. Eldredge

"Don't be swayed from your goals!" advises Golden Aggie Noreen Tingey Eldredge. Noreen's accomplishments show that she has taken that advice to heart.

Throughout Noreen's life she has had three major influences that helped her to keep that desire: her parents; Mrs. Greaves, mother of her best childhood friend, Thelma; and Noreen's husband, Arnold Eldredge.

Noreen was born in Logan, Utah, to Dr. Delmar C. and Maybell Tingey. Her young life was influenced greatly by her parents. Both parents were graduates from Utah State College, so learning was an important aspect of their home. Noreen's father was a professor at Utah State and while she was growing up she watched him work to produce the *Delmar Wheat* which saved Utah farmer's wheat from wheat smut. Noreen learned from watching her mother and father that hard work paid off. Both of Noreen's parents encouraged her to learn and to set high goals.

Mrs. Ethylen Greaves served as a role model who accomplished much both in the home and academically. As the second wife of Dr. Joseph Greaves, Noreen's major professor, Ethylen raised five stepchildren and three of her own, yet managed to obtain a doctorate at Berkeley. Later she worked for the USU Extension Service and became dean of the School of Home Economics at USU.

Each of Ethylen's children received no less than master's degrees and most received doctorates. "That's not unusual now, but it was back then," Noreen said. "Mrs. Greaves was a role model for me because she showed me that I could have a career and a family."

Noreen went to elementary school, middle school, and high school in Logan, graduating from Logan High School in 1942. She followed her mother and father's footsteps by continuing her education at Utah State.

Her favorite classes at USU were life sciences and organic chemistry, yet she also had a love for English. She loved to write



Noreen Eldredge at the 1946 graduation.

and worked on the English department magazine. She also worked on the USU yearbook and with the LDS Institute's activities, where she was the Lambda Delta Chi Chapter President.

Noreen readily admits, "[College] was work. It wasn't easy for me. I spent a lot of hours in the library!" Her hard work paid off—Noreen graduated from Utah State in 1946 as the class valedictorian! She obtained a BS degree in bacteriology and biochemistry with a 4.0 GPA.

In addition to her class work and extracurricular work, Noreen became engaged during her senior year to Arnold L. Eldredge. Noreen said, "He supported me and my goals. He wanted me to be educated. You don't find many men like him."

After graduating in 1946, Noreen was accepted to Stanford University. She left Arnold for one year, hoping he too would be accepted to Stanford when he graduated, which indeed happened the next year. After one more year of school, they returned to Logan and were married in June 1948.

Both Noreen and Arnold continued their education at Stanford University, making their home in Woodside, California. Noreen received a PhD degree in biochemistry in 1951, and Arnold received an MS degree and an EE degree in electrical engineering.

Once Noreen graduated, she became a research associate at Stanford University Medical School. In 1955, she paused in her career and became mother to a baby girl, Candyce. After a three-year period, she returned to Stanford, working in pharmacology and then the pediatric department, working mostly on biochemistry. During this time she had two sons, Delmar and Derio. She then started her own consulting company.

Noreen retired in 1992 but soon got bored. She returned to the work force with MAST Immunosystems where she still works. She manages the Research and Development Department, where one project resulted in the development of the kits that are used for drawing blood samples.

The Eldredges still reside in Woodside and enjoy traveling and seeing their family.

Noreen is a woman who has done much with her life. She has taken the time to carefully plan her goals and accomplish them. She is a wonderful credit to her parents, her husband, and even Dr. Ethylen Greaves, as well as a fine example to her own children. Candyce and Delmar have finished college and Derio is a student at Brigham Young University. The College of Science congratulates Noreen T. Eldredge on a lifetime of excellence.

1996 Golden Aggies in Science

CARL BAIRD
SETH BILLE
CARL CHADWICK

NOREEN ELDRIDGE
RICHARD GILMORE
DARRELL MADDOCK

JOHN MILLER
CLAIR PAYNE
STEPHEN WOOD

1946—

Golden Aggie Carl J. Baird

Can you imagine seven decades of outdoor activities? If you can then you'd have a life as demanding and interesting as Carl J. Baird's.

Baird grew up in Willard, Utah, and as a youth was heavily involved in Utah's 4-H Extension program. Baird was a natural to the outdoors and so before it ever became a career it was a love. Although he was interested in the outdoors it was not until he had a cousin who majored in science at college that Baird realized he could pursue it as a career.

When he graduated from Box Elder High School in Brigham City, Utah, Baird started his general education courses at Weber State College. While there, he worked at Hill Air Force Base (HAFB) as a civilian aircraft engine parts specialist in the U.S. Army Air Corp. During World War II, Baird was able to graduate from Weber State College.

Just before World War II ended, Baird transferred to Utah State. The war had caused many problems in the United States and Utah State was not left untouched. Yet, Baird was able to obtain a BS degree in botany-range management and geology. "Utah State was good to me. They helped me get a degree when it was nearly impossible."

While Baird attended Utah State, he was busy going to school and supporting his wife, Kathryn, and their first son. He worked at the Forestry Nursery for 40 cents an hour, worked nights as a taxi cab driver in Logan, and in the summer as a forest ranger. He also enjoyed being a part of the Utah State University Orchestra, playing the trombone and the baritone.

After graduation, Baird received his first assignment in the Sierra Nevada's as a range conservationist. With his wife and son they set up house in a small cabin. From the Sierras, Baird and his family began their journey in public service. Many different assignments Baird accepted required he be gone for weeks at a time, and he is quick to give tribute to his wife. "When I was gone, my wife was the fire dispatcher. She was alone a lot and had to take on a lot of responsibility. We moved 14 times and without my wife I couldn't have done it!" Together the Bairds have four sons: James, Ted, Robert, and David.

Baird worked in the west for ten years as a district forest



Carl Baird and son James in 1947.

ranger, then in 1958 he and his family moved east where he did post-graduate work in administration at the USDA School of Administrative Management in Annapolis, Maryland, and at the USDA Graduate School in Washington, D.C. While in Washington, he served as vice chairman of the Society of American Forestry-Range Management and made inspections of ten National Forest regions that covered 46 states, including Alaska; worked on the advisory staff to the Chief of the U.S. Forest Service; was a member of the U.S. Civil Service Board of Examiners; was Director of the National Forest Outdoor Recreation Review; and was Forest Service Liaison to the President's Outdoor Recreation Review Commission-National Park Service.

As a result of Baird's work, two major legislative items were passed: The Wilderness Act and The Wild Rivers Act. The Wilderness Act deals with setting aside and protecting wilderness areas while The Wild Rivers Act deals with prohibiting further dams and water diversions from being built on specific rivers. Baird was involved in many controversial and important conservation efforts. "I was there raising my voice. Personally, it was a very satisfying career because I made an affect."

After several years in Washington, Baird decided that he wanted to finish raising his family in the West and was able to return to Utah and reside in Ogden. He served as the acting director of soil and watershed management for the U.S. Forest Service Intermountain Region. He worked on an investigation of the Salmon River for The Wild River Act, and managed the Four-State Watershed Rehabilitation Program, which included flood prevention and cooperative watershed programs for 16 National Forests.

Throughout Baird's 40-year employment with the United States Forest Service, he worked in all the natural resource fields. Baird notes that it is unusual to be in all the fields and he jokes, "I had a lot to say and I said it. That's probably why I got moved around so much!"

Baird recently retired from his position as the Water Rights Administrator for the U.S. Forest Service Intermountain Region Office for Utah, Idaho, Nevada, and Wyoming. He still resides in Ogden and loves having his four sons, ten grandchildren, and ten great grandchildren close by.

Baird's life has been one of service and change. He was able to turn what he loved into a career and made a difference in the lives of many people. He is presently regarded as one of the most knowledgeable among active or retired Forest Service personnel on watershed management for the Wasatch Front. The College of Science salutes Baird and his accomplishments.



Jim MacMahon and Bob Oaks.



*Jim MacMahon and
Cathy Welch.*



*Jim MacMahon and
Sarah South.*

Awards ceremony



Jim MacMahon and Mary V. Kolesar.



Dan Nakano.



*Ann Marie Harris,
Huey Yan, and
Kathryn Turner.*



Jim MacMahon and Keith Mott.



Beverly and Jerry Ridenhour.



*Tony Bringhurst
and Duane Loveland.*

*Olcay Akman
and Mike Minnotte.*



Dean's coffee break



Jim Shaver and Jim Gessaman.



*Jan Egbert,
Duane Loveland,
and Kellie (Long) Goodwin.*



Carl Baird and Katherine Angelos.

Graduation open house

Eiko Anderson.



*Dustin Seager,
Christy Isakson,
and Tim Trebolor.*



Ian Anderson and Steve R. Hogan



*Leroy Beasley, Ann Marie Harris, Britney
Harris, Eiko Anderson, and Marie Donigan.*



Jessica Burch.



Eastman Hatch.



*Mike Christensen and Eric Nelson,
the Lightwood Duo.*

A season with the bison

So you want to see bison and you don't know where to go? Why not try the Great Salt Lake and its amazing little Antelope Island.

Back in the late 1800s, Utah began to look at Antelope Island as a place for conservation. It was originally a place for experimentation. The early settlers of Utah noticed that animals placed there, with few exceptions, were able to repopulate very well. Settlers used it to breed horses, cattle, sheep, and assorted fowl. The Island Improvement Company owned most of the island from 1884 through 1972, when Utah purchased the northern 2,000 acres for a state park. In 1981, the State was able to

purchase the remainder of the island. From that point on the State began to maintain Antelope Island and monitor its ecosystem.

The earliest record of bison



The bison herd on Antelope Island has grown large.

arriving at Antelope Island is in 1893, when the United States government brought an unknown number of them into Utah from Wyoming for the Indians to use. The Indians kept the bison for only a short time and then sold the remaining animals to the Glassman family of Ogden. The Glassman family maintained the bison as an exhibit, but because this was unprofitable they sold the last 12 bison to John E. Dooly and W. H. White of the Island Improvement Company. The bison were ferried to Antelope Island and left to roam and breed. It was agreed that the bison would undergo a roundup every year to monitor their breeding and health.

In 1987, state park officials took over Antelope Island and the annual roundup of the bison, then in 1987 decided that to maximize the health of the herd and the calves they would begin a common practice in bison and cattle management, forced weaning. This means the over winter removal of calves from their mothers.

The state park decided to incorporate the forced weaning to increase the population of the herd by decreasing stress on the mothers during the winter. The money raised from selling the bison would help fund Antelope Island activity. This positive action helps diversify the herd, control the inbreeding of the bison, and keep the mothers in good health.

Park personnel strictly control weaning of the bison. Only

those bison 250 pounds or more are weaned. Bison under 250 pounds remain with their mothers to continue growing. Because of the size of Antelope Island, its range can only support 600 bison, give or take a few. The extra bison are sold in an annual sealed bid.

Recently Jennifer Bohannon, a graduate student in Utah State University's Department of Biology, began a research project investigating the effects of forced weaning on the mother-daughter relationship of the bison.

"I decided to do my project on the mother-daughter relationship and the forced weaning because their relationship is the only one among bison that stays intact over the years," Bohannon said. "In fact, a mother bison's daughter will return to her mother even after her mother has given birth to another calf." Studies have shown daughters may benefit from associating with their mothers after the age of weaning.

Bohannon will spend two field seasons on Antelope Island, including this past season. "There are still a lot of data that need to be collected. I will need my other field season to really find out the effects," Bohannon said. Part of her first field season

included participating in the annual roundup held at the end of October, and then the paint balling and tagging of the bison that she wants to study. The heart of Bohannon's project will come at the end of her second field season when she is able to collect and analyze all her data.

For now, Bohannon has learned the herd and become familiar with the animals she wants to study in the spring. But as Bohannon said, "They are a hard bunch to study. Even though they have no real predators out there, they still spook so easily! I have to be very careful when I approach them and make sure I'm down wind or they'll just stampede!" Luckily the bison run

the opposite way so she has never been run over. For some unknown reason, the bison are less sensitive to Bohannon in her truck and she is able to study them with a spotting scope.

"Spotting the bison from my truck can be easier, because they don't spook so easily, and then I can look for any of the animals I am studying, and, if they are not there, I can just drive on to the next spot. Bison move in groups, not as a herd, so sometimes it can be easier to find them."

Driving on to the next spot is sometimes the best way to go. Bison groups constantly move and individuals can change groups daily. Bohannon says there is a theory why they do this: "Bison tend to follow a group that is doing what they want to do. If a group is sleeping and one of the other bison from another group decides he's sleepy, he'll go join them. If one from a sleeping group sees a group going for water and she's thirsty, she'll follow them. Being in a group helps to protect them."



Jennifer Bohannon and two helpers prepare to mark bison with paint balls.

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Faculty and students receive accolades



Adviser of the Year
Dr. Richard J. Mueller

Curriculum knowledge, department know-how, and problem solving skills are all needed in a good adviser. But in addition to having these skills, Richard Mueller sincerely cares about students' goals and academic achievements, going out of his way to give them the attention and time they need. "Mueller always has time to help a student in any way possible . . . I find no faculty member at this university who has a more caring attitude about students," wrote Dean James MacMahon. The students agree. "Because of my busy schedule, [Mueller] has stayed in his office to meet an appointment and answer my questions," wrote student Bradford Bentley. Mueller is an associate professor of biology, and served as acting department head of biology from 1992-1994. He received a PhD degree in botany from the University of California, Berkeley, and he has been at USU since 1982.



Teacher of the Year
Dr. Kathryn Turner

Students who have once been in Kathryn Turner's class often camp out at her door, seeking to enroll in subsequent classes. Why? Turner loves to teach and it shows in her highly organized, clear lessons, peppered with a sense of humor and enthusiasm for mathematics. "The environment in her classes is the most productive I've witnessed," said Chris Coray, professor of mathematics and statistics. "The students are always attentive, interested, offer questions and comments, and are connected to the instructor." In fact, Turner's classes have the highest student retention rate of any in the Department. As an associate professor of mathematics, Turner has taught a wide variety of courses from calculus to her research speciality in numerical analysis. She received a PhD degree in mathematical sciences from Rice University and has been at USU since 1987.



Researcher of the Year
Dr. Keith A. Mott

When Keith Mott publishes, people in the biology world pay attention because they know the work is original and of the highest quality. Mott "charts his own path based on his own understanding of underlying principles," according to Biology

Department Head Edmund Brodie. "Mott is not one to jump on the latest bandwagon and muddy the waters by publishing

quantities of inadequate hypotheses and incomplete data. Mott publishes when he has a solid contribution in hand."

Mott has been involved in several projects that have won the respect of colleagues around the world. One colleague from Melbourne, Australia, wrote, "he made the first relatively unequivocal demonstration that the rate of photosynthesis in leaves, following a rise in light intensity, is largely limited by the activation of rubisco, a CO²-fixing enzyme ribulose biphosphate carboxylase." In another study, Mott researched the environmental signals that control stomatal opening and closing, and how stomata respond to humidity changes. He learned through replacing the nitrogen air with helium that transpiration, rather than humidity, determines stomatal response. "Over the years, he has designed sophisticated technical approaches to measuring stomatal responses that have been remarkably effective in providing clear-cut answers to questions about how stomates work," said Jeff Seemann of the University of Nevada. Mott received a PhD degree from the University of Arizona and has been at Utah State since 1984.

Graduate Student Researcher of the Year

Co-winners: Aditya Khindaria and Ernestine A. Lee

This year the College of Science named two outstanding graduate students for this award. Although they have very different research areas, the committees could not choose one over the other, as their individual accomplishments are so great.



Aditya Khindaria

Aditya (Adi) Khindaria's research involved enzymes from wood-rotting fungi. These fungi degrade lignin in wood. They can also degrade a wide variety of environmental pollutants using the same enzymes. The chemicals can be degraded to water and carbon dioxide and salt, if they are chlorinated substances. Thus, many different reactions, both reductive and oxidative, must be involved in the degradation of chemicals. Adi learned how enzymes secreted by the fungi accomplish these reactions. He is an inventor on a patent awarded for this discovery.



Ernestine A. Lee

The quality of Ernestine A. Lee's research, electron dynamics in the transition regime between classical and quantum mechanics, stands up against that of graduate students at any school in the country. "Fully numerical

ACCOLADES
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New faculty join College of Science



DAVID M. GOODSTEIN
PHYSICS

David M. Goodstein joined the Physics Department as assistant professor in July 1996. Before coming to Utah State, he was a postdoctoral research associate at Cornell University. He is excited about his research here.

"I'm studying new ways of growing thin films used to construct microelectronic devices such as computer chips. It's important for the performance of these devices that the layers are uniform and flat. That's usually accomplished by growing them at high temperatures. It's like buttering toast when it's warm: the butter spreads out evenly. But the current generation of devices can't withstand the heat necessary to grow a smooth layer thermally. That's where ion beams are useful. By hitting the surface with an ion beam, we can provide enough energy to smooth out a layer, without having to heat the whole device up. To continue the analogy, it's like using a knife to spread the butter on the toast. I'll be looking at what types and energies of ion beams are most effective for growing smooth layers."

Another exciting angle to Goodstein's research is that he gets to use a relatively recent experimental approach: Scanning Tunneling Microscopy (STM). This technique for imaging the surface of a material lets him see individual atoms. "I'll be able to tell how effectively I'm smoothing out a surface by looking at its structure at the atomic level," he said.

Goodstein and his wife, Olga Perkovic (also a physicist), love hiking, especially in the Tetons, and traveling. He received a PhD degree in physics from Cornell University in 1990.



ALVAN C. HENGGE
CHEMISTRY AND BIOCHEMISTRY

Alvan C. Hengge joined the Department of Chemistry and Biochemistry as assistant professor in September 1996 and enjoys very much his research and teaching experiences here. Since his research spans both the organic chemistry and biochemistry fields, he's

excited to be at a university that has a combined department. "I certainly have one foot planted in each pool, so I wanted to end up in a department where the two were communicating with each other," said Hengge.

"In living things, chemical reactions are catalyzed by enzymes, and they occur thousands or even millions of times faster than they would by themselves. What really interests me is the study of how nature has evolved these extraordinarily good catalysts that allow life to take place. For instance, if it weren't for the

digestive enzymes that help us digest food, it would take us months to digest one meal—we would die of starvation on a full stomach. So, somehow, nature has evolved catalysts that help us digest food and duplicate our DNA. The nitty gritty details of exactly how catalysts work is what I'm trying to learn in my research."

Hengge lives in Smithfield with his wife, Maribeth, and young son and daughter. In his spare time, he can be found cross-country skiing, birdwatching, and spending time with his family. He especially enjoys riding his bicycle and toting his children in an attached bicycle trailer. "It gives me a good workout," said Hengge.

He received a PhD degree in organic chemistry from the University of Cincinnati in 1987 and comes to Utah State from the University of Wisconsin-Madison, where he was an assistant scientist.



XIAOFENG REN
MATHEMATICS AND STATISTICS

Xiaofeng Ren joins the Department of Mathematics and Statistics as assistant professor. Prior to his arrival, he held a visiting assistant professorship position at Brigham Young University and a postdoctoral position in the Institute for Mathematics and its Application (IMA)

at the University of Minnesota. He received a BS degree in mathematics from Zhejiang University, Hangzhou, China, in 1990, and a PhD degree in mathematics from the University of Minnesota in 1994.

Ren enjoys teaching at Utah State. "I interviewed at a lot of places, and this place just suits me best," he said. In addition to teaching calculus and other classes, Ren continues his research and is particularly interested in equations that model phase transformations of various liquid and solid materials, such as the application of mathematics in elastic properties and electrical conductivity. With a fellowship from Minnesota Supercomputer Institute, Ren is co-principal investigator of a project titled "Nonlocal Evolution of Microstructures in Solids," which numerically studies an elastic bar in a small scale where nonlinearity and nonlocality both enter the constitutive energy-strain relation. Using a Cray Y-MP supercomputer, he simulates the microstructures and their creation processes.

He enjoys traveling and has many opportunities to do so as he collaborates with mathematicians from around the world. Before coming to USU, Ren spent a week in Hong Kong visiting a collaborator there. This coming summer, he will travel to Italy with a small group to do research, as Italy has a strong school for nonlinear partial differential equations. Ren likes living in Logan and enjoys swimming, bicycling, and playing tennis and soccer.



ERIC R. ROWLEY
MATHEMATICS AND STATISTICS

"I enjoy teaching, I enjoy math, and I like this university," said Eric R. Rowley, who joins the Department of Mathematics and Statistics as a lecturer. He teaches many math education courses for both elementary and secondary education majors, as well as other courses

such as calculus. After earning a BS degree from Utah State in 1985, he was a Utah public school teacher for three years before coming back to USU to earn an MS degree in 1991 and a PhD degree in 1996. As part of his graduate work, Rowley was a visiting instructor at the University of Montana, where he completed his dissertation entitled "Alternative Assessment of Meaningful Learning of Calculus Content: A Development and Validation of Item Pools."

Rowley was born and raised in Monticello, Utah, and loves hiking, skiing, motorcycling, snowboarding, and kayaking. He and his wife, Brenda, have two sons.



CAROL D. VON DOHLEN
BIOLOGY

Dr. Carol D. von Dohlen is a new assistant professor in the Department of Biology. She obtained a BA degree in biology from Dartmouth College and MS and PhD degrees from the Department of Zoology at the University of Maryland. She finished her dissertation

while she taught a year at Idaho State University in Pocatello, and then pursued her postdoctoral research at the University of Arizona in Tucson. von Dohlen, who joined our staff in July is working with Dr. Hansen to assume management of the USU Insect Collection.

von Dohlen's research interests are in using molecular biological techniques, such as DNA sequencing, to reconstruct the phylogeny, or evolutionary history of insects, mainly in the order Hemiptera, specifically aphids, scales, cicadas, etc. The simple terms, von Dohlen studies the DNA of insects to help make "maps" of insect evolution.

Once the phylogeny is established, the information can be used to study the evolution of biological attributes. For example, many aphids have complicated lifecycles, can switch host plants, and live on many agricultural crops; we could use their phylogeny as a map to determine how these switching cycles evolve. These data could be helpful in showing us how aphids shift from native plants to using crops as hosts.

von Dohlen has used molecular phylogenetics to study the

cospeciation of aphids and their bacterial gut endosymbionts and has used molecular markers for aphid taxonomy. This type of taxonomy can help to match individuals from different phases of the life cycle and determine species limitations. von Dohlen is also interested in studying the interaction and evolution of aphids and the crop plant viruses they transmit. About her research von Dohlen said, "I love it! It's such a thrill to discover something new; even if it's a small thing, it is still wonderful to find!"

von Dohlen is married to Dr. Laurens Smith, an associate professor of physiology at Idaho State University. They have a daughter named Clara who keeps them busy and on their toes. As a family, they enjoy walking, hiking, and playing with their four dogs. von Dohlen enjoys cross-country skiing, insect collecting (they have plenty around their home), classical music, her research, and sedate mountain biking.

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Even though her project is far from over, Bohannon said, "I love it! I love being out there on the island and learning about the bison. It's a fascinating place; it seems so barren, but it's not. You can look across the island and see Salt Lake City, Ogden, Bountiful, and all the people, but it's so far away and the island is so quiet. It really is an amazing place."

The College of Science looks forward to the completion of Bohannon's research and will report her findings in *Insights* when she has finished the project.

NATIONAL

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science, and secondary math areas. Approximately 200 teachers met in the nation's capital to enjoy dinner dances, elaborate meals, and a cruise on the Potomac, as well as meetings and orientations. For Welch, the highlight of the week was at the awards ceremony at the National Academy of Sciences, where Hillary Clinton spoke. When the teachers arrived in the auditorium, they were assigned seats away from the front row, leaving the best seats for dignitaries. When Mrs. Clinton arrived, however, she insisted that the teachers sit in the front row. "She gave an excellent speech," said Welch. "She was very sincere and warm." Following Mrs. Clinton's speech, the teachers were presented their awards.

Welch earned her place at Capital Hill that night—and continues to earn her place among the nation's great teachers as she inspires her students with a love for science.

ACCOLADES

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calculations in these problems are either very difficult or impossible to perform even with today's computational capabilities," wrote Turgay Uzer, a physics professor at Georgia Institute of Technology in Atlanta. "Progress in Ms. Lee's field requires a working knowledge of both classical and quantum mechanics as well as nonlinear dynamics." Lee has discovered a new phenomenon in atomic physics—examining the possibility of creating locally harmonic, nonspreading Rydberg electron wavepackets in an atom. These wavepackets have many uses and are essential in probing quantum mechanics. Lee is the first author of an article published in *Physical Review Letters*—the premier journal in the physics world. She has also written three other papers, with two more in progress.



Graduate Student Teacher of the Year
Ann Marie Harris

Ann Marie Harris, a graduate student in the mathematics and statistics department, has been hailed by students and faculty as an innovative, effective teacher who expects her students to learn mathematics, not just regurgitate information. She does this with an

enthusiasm for the subject and a willingness to help students any way she can, even donating weekend time to help with homework. Harris believes that "teaching is a privilege" and wants to make a difference in the attitudes of students, helping them to realize their own abilities in the field of mathematics. She received a BA degree in mathematics, English, and Spanish from the Mississippi University for Women, an MS degree in mathematics from USU in 1995, and is currently teaching at Idaho State University.



1996 Valedictorian
Robert Viron Lane

Robert Viron Lane, originally from Pocatello, Idaho, is our 1996 USU Valedictorian.

Lane graduated from USU with a perfect 4.0 in biology. "I studied for my grades, but all that studying has paid off." While at USU Lane was also busy

with outside interests. "I was involved with Alpha Epsilon Delta [pre-med honor society] as their treasurer, a peer advisor for the Biology Department, on the Science Council, and President of the Mortar Board [service organization]." Lane's dedication to his studies and interests shows in the gamut of awards he received, including the Freshman Chemistry Handbook Award, the ASUSU service award for his help with the Science Council, the Biology Department award for his GPA, the Alpha Epsilon Delta award, a nationally awarded scholarship, and others.

Lane is attending St. Louis University School of Medicine, where he is carrying the equivalent of 35 USU credits. He and his

wife of two years, Jennifer, enjoy, "... being able to spend time together. We keep pretty busy." Lane also enjoys racquetball, basketball, and soccer.

Lane said, "I really enjoyed USU. When I left I felt very prepared to go on to medical school."



Scholar of the Year
J'Dee Wilson

J'Dee Wilson, an Idaho native, came to USU on a track scholarship. While at Utah State J'Dee ran track along with maintaining a perfect 4.0 GPA. J'Dee was one of four Athlete of the Year nominees and the nominee from the College of Science for Scholar of the year.

Track and school kept him on a busy course.

J'Dee graduated from USU with a BA of Arts in Biology. In addition to track and school, J'Dee worked in the Howard Hughes lab at USU. "I really enjoyed USU. I feel like it has given me a great background in science." And J'Dee will definitely need that background now in his first year of medical school at the University of Utah.

"I go to school from 8:00 A.M. to 5:00 P.M. and just like the rest of the 100 students in my classes, I carry 29 credits. It really keeps me busy, but being busy makes me happy."

J'Dee and his wife, Julie, have one son named Josh and at the time of this interview, had just had their second son, Brandon. J'Dee says, "My wife is amazing. She really keeps us going. I definitely couldn't do it without her."

Just as a special note, J'Dee received one of 15 NCAA post graduate scholarships. This scholarship is a great honor because there are so few given out. J'Dee has also been chosen to be on the First Team Academic All American Selection for the country by the Sports Information Director of America. They sent him a crystal trophy and he was featured in the *Salt Lake Tribune*.

About J'Dee's accomplishments he says, "I tried to work hard in school. It's nice to find a balance in both school and track and be able to succeed in both."

Insights, the newsletter of the Utah State University College of Science, is published twice a year. Its purpose is to inform alumni and friends of current events, projects, and changes happening within the College. The newsletter also provides a forum for alumni to follow one another's careers and professional development. This issue of *Insights* was under the direction of Paula H. Larsen, intern coordinator and editor, and Colette D. Yates, project coordinator and editor. Contributors include English Department interns Rose D. Greer and Jennifer Lyman, Steve Aust, and Dean James MacMahon. Special thanks to Gene Underwood, Jennifer Bohannon, and USU Photo Services for the photographs, to Linda Keith of Editorial Services, and to Kandy Baumgardner.

Alumnet Responses

Merrill W. Adams (BS 1992, physics) received a commission in the army and spent three and a half years as an infantry officer with the 101st Airborne Division. He currently works as a Nalco Technology sales representative in Salem, Oregon. He is married to Rakell (BS 1991, elementary education) and they have two daughters, Laura and Hannah. They miss Utah State and Logan!

Allan T. Andrew (PhD 1974, bacteriology) became a member of the Biology Department at Indiana University of Pennsylvania in 1974. Currently, he serves as dean's associate in the College of Natural Sciences and Mathematics. He is also coordinator of the Natural Science Programs and Pre-Professional Programs at the university.

Teri Bench (BS 1993, math education) teaches math and computers at Mt. Jordan Middle School in Sandy, Utah, and has sponsored "Math Counts" teams for two years. Her husband, Jason, has completed a master's degree and works for Provo City. They reside in Orem with their three daughters.

Dennis M. Forsythe (MS 1962, zoology) went on to earn a PhD degree in zoology from Clemson University in 1974. He is a professor of biology at The Citadel in Charleston, South Carolina, where his research has included bird-aircraft collision hazards and bird bioacoustics. Dennis is a member of Beta Beta Beta, Sigma Xi, and the American Ornithology Union. He is married to the former Donna Wolfe, has two children by a previous marriage, and three grandchildren.

John Goodrich (BS 1986, biology) received a DDS degree from Creighton University in 1991. He is happily self-employed as well as happily married. He and his wife have four children, and they enjoy having them home-schooled. The family lives in Idaho where they are active in both community and church activities.

Kathryn A. Green (MS 1993, mathematical statistics) works as a mathematical statistician for the Internal Revenue Service in Washington, D.C., managing a statistical analysis on foreign corporations controlled by large U.S. corporations. The results of the study are given to the Office of Tax Analysis and the Joint Committee on Taxation for further tax analysis and economic modeling. She enjoys living in the nation's capital and all of the opportunities it offers.

Barbara P. Hill (BS 1952, science/public health) is a practicing nurse and resides in Salt Lake City.

Scott L. Hope (BS 1977, biology) received a DMD degree from Washington University in 1979 and an MS degree from St. Louis University in 1981. Scott has been a private orthodontist for 15 years in Riverside and Murrieta, California. He is married, has five children, and stays busy with family, church, and community service.

Mike R. Jenkins (BS 1994, biology) is currently studying medicine at the University of Health Sciences, College of Osteopathic Medicine, in Kansas City, Missouri. He anticipates graduating with a doctorate of osteopathic medicine in May 1998, then completing his residency training in either head and neck or orthopedic surgery. He is married and has two children.

Oliver Ray Knutson (MM 1973, mathematics) recently completed a nine-year assignment in Egypt as the training manager for General Dynamics Services Company. He worked on the successful coproduction of the main battle tank for the Egyptian Army and enjoyed working with the Egyptians.

Howard S. Lewis (BS 1967, zoology) received an MS degree from the University of Wisconsin in 1972. He is now an environmental manager in Indonesia at one of the five largest copper and gold mines in the world. The project is located in Irian Jaya, the most remote province in the country. In his job, he manages programs in reclamation, environmental monitoring, solid waste management, and analytical laboratory services.

Julie Mitchell Palmer (MS 1980, plant biology) received a PhD degree from the University of Texas in 1989, then spent three years doing postdoctoral research at the Carnegie Institution on the campus of Stanford University. She now teaches undergraduate biology courses at the University of Texas and is married to Dr. John W. LaClaire II, professor in the Botany Department.

Rex A. Richards (MS 1967, biochemistry and plant nutrition; PhD 1972, plant physiology) is the senior principal engineer/scientist at Thiokol Corporation. He served as the Thiokol corporate coordinator for the elimination of hazardous solvents and was successfully nominated for the Space Operations for EPA's Stratospheric Ozone Protection Award. He has five children at Utah State and is currently working with two of them on obsolescence challenges on the space shuttle.

Kathy Anderson Stover (MM 1973, mathematics; BS 1971, math/secondary education) teaches precalculus/calculus at Twin Falls High School in Idaho. She is on the staff at the College of Southern Idaho, enabling her calculus students to receive college credit or take the AP calculus exam. Her husband, Paul Stover, teaches English at Twin Falls High School. They have two children: the first is a senior at Utah State and the second is a freshman at the University of Utah.

Peter Sykes (BS 1993, public health) works for the State Industrial Commission as a safety and health officer for OSHA. He resides in Salt Lake City.

Kevin Yokoyama (MS 1989, mathematics) has been a math professor at the College of the Redwoods since 1990. He served as Mathematics Department chair from 1993-1995 and has been busy teaching mathematics courses and working on several grant projects. He is married, has four children, and enjoys living in a two-and-a-half-acre redwood forest above the college.

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A L U M N E E T

Dear College of Science Alumni and Friends,

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