



Insights

Spring 1997

College of Science

Alumni Newsletter

Vol. 5 Issue 2

MacMahon's Musings

Hallelujah!!! The \$24 million to replace Widtsoe Hall has been approved by the legislators during the final days of the 1997 session. I want to thank any of you who heeded my call for help in contacting your senators or representatives to put in a good word for us. I think input from our alumni really helped, as did an outstanding performance by a few of our undergraduates who accompanied us at our presentation to the Capital Facilities Committee.

As time went on, we gradually gained backing and were included as the number three priority for a bonding bill to fund construction projects. This means that, unless something odd happens, we will soon be announcing the contractor and construction will start this summer, probably in July or August. As the time for ground breaking approaches, we will let you know more details. I am sure some of you would like to join us for that happy occasion.

I want to thank those of you who responded to recent phone calls asking for contributions to the College of Science Development Fund. Sources for funding have changed and we must appeal to our friends for some help since the State cannot always provide the funds we need for special projects.

As I mentioned to you previously, one of those projects, The Science Learning Center, is planned as part of the overall Widtsoe Hall endeavor, but depends on non-State sources of funds. This construction would start as the Widtsoe building is completed and would occupy the site of the current Widtsoe building. To realize this dream, we need to find \$3 million in the near future. If anyone has any ideas for sources of this significant funding, please let me know.



Dean James A.
MacMahon

MUSINGS

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Private Research Data Aids Professors in Understanding Cache Valley Fault Structure

James P. Evans and Robert Q. Oaks, Jr., of the Geology Department probably know this valley's subsurface structure better than anyone living here.

These professors have taken advantage of data from wells drilled by Amoco and Placid oil companies for oil exploration—on Hauser Farms next to Newton Mountain and at the Logan airport—to give them access to Paleozoic rock formations 250-700 million years old as well as rocks of other ages. They published their findings in a recent paper in the *Bulletin of the Geological Society of America*. This project involved mapping with seismic waves the area between Jackson Hole and the Great Salt Lake. Sonar reflectance charts, called seismic profiles, show changes in sound wave reflections and give approximations of a geologic cross section.



Aerial view of Cache Valley, taken by Jerry DeGraff ('76) shows East and West Cache faults.

The analyses of subsurface geology done by Evans and Oaks have shown that Cache Valley has several faults, two of which are capable of producing magnitude 7.0 earthquakes. Fortunately, neither is very active. These faults run north-south:

the East Cache fault (see accompanying photo) runs along the eastern bench of the valley, and the West Cache fault runs along the Wellsville and Clarkston mountain ranges. Until these two faults become more active, smaller faults are of slight importance.

The East and West Cache faults seem to take turns being active, in

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Predicting Space Weather: USU Scientists Research Methods that Could Save Millions in Satellite Losses

Every year, government and private industry spend millions of dollars building high-tech satellites. And, every year some of these satellites are lost—damaged in space and unable to be used. Until now, the cause of the damage has been unknown, so building damage-proof satellites has been difficult, if not impossible. If scientists could find the source of the damage, they could better understand how to repair the satellites and could devise schemes to mitigate future damage. Scientists at USU believe they are closing in on the source.

Dr. Robert Schunk and Dr. Jan Sojka, physicists in the USU Center for Atmospheric and Space Sciences and the Physics Department, are researching the effects of magnetic storms on the atmosphere. A magnetic storm is the result of a disturbance from the sun, and these storms have the power to interrupt communications systems on the ground as well as in space.

Within the last ten years, the various communities concerned with space systems—the scientists, the forecasters, electrical

research is focused on not only continuing to build better models, but validating them against observations.

“There’s a heightened interest in knowing how good the models are in terms of predicting these weather phenomena that affect systems communications,” said Sojka.



Digital imagery helps scientists predict space weather.

“Scientists usually live in ivory towers. They don’t need to go out and build something you can sell. . . . But here, there are not only military but commercial interests that have been adversely affected; so there’s a push to bring scientists into contact with the users.”

power suppliers, military communication specialists, and anybody who has problems with space weather—formed a program called the National Space Weather Program. They recognize the need for better models and weather descriptions for the ionosphere, and Dr. Schunk, as a leader in that field, has served on various committees and participated in directing space weather research.

Schunk and Sojka are working with a computer model that simulates conditions in space and helps to make more accurate predictions of the disturbances in the atmosphere. Their primary

The model being used by USU scientists fits on a compact disc. It runs on the computers at USU, but has also run on computers at NCAR (National Center for Atmospheric Research), as well as at other NSF-sponsored facilities. The model predicts the density, temperature, and composition of the plasma in the upper atmosphere.

“Once you’ve predicted that, you can actually determine the effect it has on radiowave propagation,” said Sojka. “What we’ve developed is a kind of picture that describes the upper atmosphere and then we can put in tests (satellite tests, radio links) to find out what happens.”

Space weather information is gathered at research centers across the country and sent over the Internet to modelers like Schunk and Sojka. They, in turn, use the measurements to make their models more accurate. “We can’t change the numbers, so we say, ‘What’s wrong with the model?’” Sojka said.

So how does this help with damaged satellites? When a satellite is damaged, it cannot send further information. If it is out of reach of astronauts, it cannot be repaired and all the information it contains is lost. If the scientists can determine that damage was

College of Science Awards 1996-97

Teacher of the Year
Jill Marshall

Advisor of the Year
John Hubbard

Researcher of the Year
Jim Evans

Valedictorian
Jenny Archibald

Scholar of the Year
Mark DeWall

Graduate Student Teacher of the Year
Sean O'Leary

*Graduate Student
Researcher of the Year*
Martin Juras

WEATHER

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caused by an electrical problem due to an atmospheric disturbance, they will know how to go about designing systems that would not be susceptible to this damage.

Just this year, an AT&T communications satellite was lost, and within the past four years Canada lost two satellites. Each satellite costs hundreds of millions of dollars, so the interest level is high in finding out all the possible effects of these atmospheric disturbances. This creates a real customer need, which motivates the research process.

Sojka said, "This program is different from our regular research. Scientists usually live in ivory towers. They don't need to go out and build something you can sell. They usually just research topics to expand the community's understanding. But here, there are not only military but commercial interests that have been adversely affected, so there's a push to bring scientists into contact with the users." Working as fast as time and funding permit, researchers, customers, and modelers believe a solution is not too distant. ♦

USU Space Physicist Receives National Honor



Robert W. Schunk, a professor in the USU Physics Department, has been elected a Fellow of the American Geophysical Union (AGU). He was honored at a reception 6 March 1997, at USU and will receive the award at the AGU Annual Meeting this December.

AGU is the premier organization for scientists involved in atmospheric research, geomagnetism, geology, ocean sciences, planetology, and space physics. The union consists of more than 33,000 members who are university, industry, and government researchers. With no more than two percent of the total membership allowed as Fellows, Schunk's election is a great honor.

After receiving a BS degree in 1965 from New York University and a PhD degree in 1970 from Yale University, Schunk joined the Physics Department at USU in 1976, where he has continued to be quite prolific in his research. He currently directs the Center for Atmospheric and Space Sciences, a research organization of about 20 space physicists at USU.

Schunk leads a group of 10 theoreticians and modelers, mainly post-doctoral or higher-level scientists, working on a space weather predicting model (see article on page 2). As one of the top ionospheric theorists in the nation, he has spearheaded research through his development of ionospheric models and theories.

Schunk is responsible for bringing many distinguished programs to USU, including the NASA Theory Program which supports theoretical groups working in solar, ionospheric, magnetospheric, and cosmic ray physics. There are usually 12 to 15 such groups across the country working in these four research areas, and Schunk has the distinction of being the only principal investigator who has remained in the program since its beginning in 1980.

Schunk's honor of being elected as a Fellow of the American Geophysical Union is no surprise to his associates. This award culminates his numerous achievements as a researcher. In 1983 he received the USU D. Wynne Thorne Award for Research, in 1986 he gave the Faculty Honor Lecture, and in 1988 he received the Governor's Medal for Science and Technology.

The College of Science salutes Schunk for his outstanding achievements. ♦

MUSINGS

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The funding of Widtsoe, the advent of a break in the weather, and the prospect of seeing many of you at our Science Week festivities in May or at graduation in June makes the pall of winter seem like a thing of the distant past.

Thanks for your help and continued support. ♦

Development News

The Neville and Annie Hunsaker Scholarship Endowment for Mathematics and Statistics

Neville and Annie Hunsaker

Neville Hunsaker's life is typified by the phrase constancy amid change. Born 11 December 1907, to Israel, Jr., and Rosa Carter Hunsaker, and raised on a dry farm near Tremonton, Utah, Neville lived during an era of amazing change, yet he always valued hard work, education, and his family.

Neville was riding a horse by age three. In his reminiscences, Neville recalled his early school years, "When I was a child, our nearest neighbor was 9 miles distant. To go to school, in grades 3 and 4, I rode a horse 5 1/2 miles to attend a one-room school consisting of six children in three grades.

... One of the principal outcomes of these many long, often very cold, horseback rides for me was a vivid appreciation of the importance of educational opportunity."

When it came time to start the eighth grade, Neville's mother rented a room in Tremonton so Neville could attend the new Bear River High School, where, in 1926, he graduated second in his class. He then attended the University of Utah on a four-year scholarship and went on to complete a master's degree at the University of California, Berkeley, in 1932. While at Berkeley, Neville met Annie Peterson, a "rather tall, very slender, good looking girl. . . . We tried a campus matinee dance and this went well, so we were soon attending more interesting social events." Following an extended courtship, Neville and Annie married in 1935.

Annie had completed a bachelor's degree in math education at Berkeley, qualifying her to teach secondary math. Although she never taught formally, her children found her a valuable resource throughout their school years. She had the patience and ability to explain math concepts in a clear and understandable manner, thus inspiring the children toward careers in education and medicine.

Neville began his professional career working for Rieber Laboratories, a small company conducting geophysical exploration for subsurface structures favorable for oil, first in California, then in Houston, Texas. While in Texas, Neville switched from the oil business to academics, when he was hired to teach math at the University of Houston. For the next three years, Neville studied part time at Rice University, seeking to complete a PhD degree, while teaching full time at



the University of Houston.

In 1941, Neville brought his family to Utah, to be close to his parent's farm while continuing to teach math. His contract with Utah State Agricultural College began a long and fruitful association. After six years at USAC, Neville took a sabbatical leave to complete a PhD degree at Rice University in Houston. Then in 1956, Neville became head of the Utah State Mathematics Department. He described his years as department head as "one of the most interesting times possible to occupy such a position. In the fall of 1957, Russia launched their Sputnik into orbit and almost simultaneously launched the United States into frantic scientific endeavor. Immediately, extraordinary attention was given to

improving the teaching of mathematics in the colleges and secondary schools. . . . the National Science Foundation generously supported University efforts to improve the basic technical background of high school and junior college teachers."

Neville was primarily responsible for getting teacher improvement contracts totaling more than a million dollars for Utah State University in the years from 1958 to 1971. Dr. Larry Cannon of the Mathematics and Statistics Department said, "virtually every secondary school math teacher in the State has benefited from the USU Math Department's extension service efforts." Along with great strides in extending the University to secondary math teachers throughout the State, Neville sought to upgrade the professional quality of the Department.

Throughout his years at USU, Neville continued to run the family farm, with the help of Annie and their family, which grew to include five children: Worthen, Calvin, Hedy, Gloria, and Jesse. The family spent their summers living at the farm and their winters living in Logan. Calvin continues to run the family farm, which celebrates its one-hundredth anniversary in February 1998.

Neville continued to teach at USU until 1983, the last eight years as an emeritus professor. He wrote, "Although I got a late start as a teacher (being 31 years old), I was able to teach 45 years for which I am deeply grateful. It has been a good life."

Neville died in 1993, having lived in an era of great change. From horses to space exploration, from a fairly isolated Mathematics Department to one helping teachers everywhere in Utah and in many other states, Neville saw and experienced tremendous growth throughout his career. Since Neville's death, Annie continues to enrich the lives of those with whom she associates. She

Thank you to the individuals, corporations, and foundations for their recent major gifts to the College of Science. 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

George S. & Dolores Doré Eccles Foundation—Challenge Grant for the Science Learning Center

Mrs. Helen R. Gardner—The Eldon J. Gardner Student Research Award in Genetics

Wilford J. Hanson—George E. Bohart Endowment for the Insect Collection

Constance C. Hyde—College of Science, unrestricted

Mary I. Piette—Lawrence Piette Graduate Student Endowment

Questar Corporation Educational Foundation—Scholarships

Dr. Vincent and Audrea K. Rees—to establish the R. Garth Hansen Scholarship Endowment

Fund in the Department of Chemistry and Biochemistry

Mary E. Schaaf—College of Science Scholarship Fund

Ms. Virginia R. Scott—to establish the David Rider Scholarship Endowment for the Department of Geology

Utah Power & Light—Science Discovery Museum and Observatory

Wal-Mart Foundation—Science Discovery Museum and Observatory

In February, many of you heard from our students during the second annual College of Science phonathon. Such phonathons have been quite successful for the University throughout the past few years as they allow us to contact you personally and tell you about upcoming activities and current campaigns. Thank you for your patience with our student callers and thank you for your pledge.

HUNSAKER

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divides her time among her children: Hedy's and Gloria's families in California, Calvin's in Tremonton, Jesse's in Alpine, Utah, and Worthen's in Illinois.

Editor's note: The Neville and Annie Hunsaker Scholarship Endowment in the Department of Mathematics and Statistics was started by Neville and Annie Hunsaker in 1978. Subsequent gifts have been made by all of the children. The endowment provides a four-year scholarship to a student who demonstrates superior achievement and shows great promise for service in society.

In honor of Neville's long and distinguished career at Utah State University, the College of Science expresses a sincere thanks to the Hunsaker family for their philanthropic nature over the years and continued leadership in the Department of Mathematics and Statistics. ♦

Alumni Events 1997

May 16	A-Day on the USU Quad
June 6-7	USU Commencement
June 28	Hogle Zoo Day
July 12	Aggie Lagoon Day
July 21-28	Aggies in Alaska—cruise the coast of Alaska with the USU Alumni Association and emeriti

Aggie Chapter Events

October 3	Utah County, preceding the BYU game
Oct 10-11	Portland, Oregon, river cruise and tailgate preceding the USU-Oregon State game
Nov. 15	Reno, pregame function preceding the University of Nevada game
Nov. 22	Denton, Texas (Dallas) pregame function preceding the University of North Texas game

For more information, call Alumni Relations at 1-800-291-ALUM

Expanding Your Horizons Continues to Excite

What can be done to get teenage girls interested in math and science?

This issue has concerned many educators and parents across the country for many years. Sue Morgan, an instructor in the USU Geology Department, believes that the answer lies in providing appropriate role models, which is exactly what Expanding Your Horizons in Math and Science (EYH) is all about.

Morgan is in her fifth year as coordinator of the EYH program at USU. She became involved with EYH in the 80s when she began presenting workshops. She stresses the importance of role modeling—"That's part of what EYH is all about . . . going to different workshops and seeing what kinds of careers women have. It does get you going if you have a role model."

So what exactly is EYH? It is a one-day conference for girls grades 6-12 and their parents that focuses on career opportunities for women in science- and math-related fields. This year's conference began with a keynote address to the girls and their parents. Speaker Jayceen Craven, a science educator for the Hansen Planetarium in Salt Lake City, gave a hands-on presentation about the laws of thermodynamics and conserving energy that had the young women literally jumping out of their seats to participate. Through interactive demonstrations such as pedaling a bicycle to create energy to illuminate a light bulb, Craven showed the participants everyday kinds of applications of scientific principles. Her dynamic personality and high-energy presentation got the audience excited about science and served as the perfect introduction to the day's other events.

Following Craven's introduction, the young women separated into small groups according to age and interest where they participated in hands-on workshops. The presenters of these workshops demonstrated how knowledge of science-related material is important in their own career fields. From nutrition to as-

tronomy, massage therapy to microbiology, the young women get an understanding of why math and science is important and interesting. Some participants learned about what physicians really do and practiced sewing up real pig's feet, while others explored the latest computer technology. Still others investigated how planes fly, how to make—or lose—money through investments, or how to determine a geologically safe site for a nuclear waste repository. Any of more than 30 workshops were available. Parents also attended their own separate workshops to learn why their daughters are interested in science and career opportunities available to them.

A career fair followed the workshops, where University departments and other contributors had displays and activities to further stimulate the girls' interest in science. The fair's purpose is to show them the variety of careers available in the science fields and to encourage them to continue their education.

Sue Morgan, EYH Coordinator, said, "We want the girls to know the sky's the limit if they have the aptitude for it. Too many girls are turned away from math and science while in middle and high school and then become completely disinterested and discouraged when they get to college. Women have a lot more opportunities

knowledge of science-related subjects.

A good education has become vital to careers in our present society. Statistics show that more and more women are raising families on their own. Morgan said, "It's hard enough, so if you find a skill and nurture that skill by education, you're going to be able to make more money."

So, does EYH achieve its goal to interest young women in math and science? There is really no way to measure the success of EYH, but there are a lot of girls who come back year after year. Nationally, there are more women entering math and science-related fields than ever before.

The program is currently in its twelfth year at USU. Initially, it was solely run by volunteers, however, Dean MacMahon felt this is an important public service and appointed a coordinator. Volunteers are still needed to help in all aspects—from fund raising to suggesting workshop participants.

"It takes a lot of people to keep EYH going," said Morgan. Anyone who would like to help by making a day or longer time commitment to EYH should contact Sue Morgan at USU. Planning for the November 1997 conference has already begun.

What can parents do to help their children take an interest in math and science? Once again, Morgan says that role modeling is a major factor. "You can say something, but unless you do it—it doesn't work for a lot of people."

Parent's involvement attending EYH and regularly exposing their children to the sciences makes all the difference. For example, taking children to a science or natural history museum and discussing what they see can stimulate their curiosity and desire to learn. When parents discover, along with their children, the children will be more interested. Parents can make collections, read books, and watch educational programs with their children.

"If parents are truly concerned, they have to make a real effort to role model for their children. You can skew your kids a little bit without hitting them over the head with it. And parent's should never, never discourage an interest," said Morgan. ♦

"We want the girls to know the sky's the limit . . ."

~Sue Morgan, EYH Coordinator

[now] than when I was growing up. Not everyone has to be a nuclear physicist, but they can get some training." EYH also provides a platform to expose the young women to many careers that have connections with math and science that don't require a science degree, but do require a

Young Women about Careers in Math and Science





*Olcay Akman, Fusun Akman, and LeRoy Beasley,
all Mathematics and Statistics.*

College of Science Coffee Break



*Biology Department Head Edmund Brodie and
University Development Officer Shirley Keyes*



*Graduate Dean James Shaver
and Homer Walker—
Mathematics and Statistics.*



*Chris Coray—Mathematics and Statistics, Farrell Edwards—Physics, and
Vincent Wickwar—CASS/Physics.*

*Graduate Dean James Shaver and
Stephen Allan—Computer Science.*



*Greg Podgorski—Biology,
Dean James MacMahon,
and Linda Woertendyke—
Biology.*

*Nancy Gilden and Jan Egbert,
both Mathematics and Statistics.*



*President George Emert,
Chemistry and Biochemistry
Department Head Vernon
Parker, and Associate Dean
Kandy Baumgardner.*



TECHNOLOGY IN THE CLASSROOM

Students in Mathematics and Statistics Courses Benefit from High-Tech Teaching Room

Picture this:

Forty advanced math students struggle to embrace a particularly beautiful algorithm. The instructor flips a switch and produces a three-dimensional, full-color illustration of the idea projected on the screen behind him. A chorus of students exclaims, "Ahhh. So that's what you mean!"

Instructors are hearing more of that since the Mathematics and Statistics Department recently opened its high-tech teaching facility. Through the University's local area network and with adequate preparation, a teacher can illustrate just about any principle he or she can program.

Faculty members need only about an hour of instruction to operate the equipment, which includes a sophisticated ceiling-mounted projection unit, a high-resolution camera, a VCR, a video disc, and sound equipment. A single computer ties the whole system together.

Illustrating slides, books, and pictures is only one of the possibilities in this facility. Software programs allow instructors to build their own visuals; however, it can take anywhere from a couple of hours to as long as several days to develop a presentation, depending on the complexity of the problem. Instructors are challenged to illustrate the changes or movement in three-dimen-

Instructors are challenged to illustrate the changes or movement in three-dimensional graphics, with no waiting time to break students' concentration.

sional graphics, with no waiting time to break students' concentration.

These graphic animations can illustrate principles such as surface deformation and fluid flow, minimum and maximum principles of calculus, interpolative functions, and best approximations in high-level mathematics.

Professor Chris Coray of the Mathematics and Statistics Department says, "This visual component is what gives students an edge for understanding." The system can illustrate and illuminate very complicated 400- and 500-level math and statistics principles that could never be fully illustrated in two dimensions.

"The use of the facility and its development should be a dynamic, evolutionary process."

~Chris Coray

The high-tech room also promises to be useful to other disciplines, although its expanded uses have yet to be investigated. Coray says, "We are so busy trying to find out what all the possible uses are for math, we don't have any time to think about other disciplines. Some bright graduate student from one of the many disciplines on campus could probably take advantage of this opportunity for some great thesis material."

Many faculty members are learning to use the new facility. Coray says, "Now that the technology is available, it is the responsibility of the faculty to learn how to use it and improve on it in every way possible. The use of the facility and its development should be a dynamic, evolutionary process."

This is an individual process—instructors are feeling their way along right now, learning the possibilities. Some teachers may find the technology distracting and not like it, while others may decide to go for the gold. And as more instructors explore the facility's ability to graphically illustrate difficult principles, more students will be heard to exclaim, "Ahhh. Now I understand!" ♦

Media-enhanced Classrooms on USU Campus

Along with the Mathematics and Statistics Department's high tech teaching room, there are 12 other media-enhanced classrooms on campus. Each facility is uniquely equipped to meet departmental needs. The facilities are partially funded by USU's Learning Resources Program and the State Higher Education Technology Initiative.

- Biology Natural Resources 102
- Business 215
- Education 131
- Education 231
- Education 282
- Engineering Classroom 106
- Library 206
- Library 218
- Old Main 115
- Old Main 121
- Old Main 225
- Technology 108

*For more information, see
<http://www.usu.edu/~mdls/MDLS/MDLS/abtmdls.html>*

1997 Commencement Activities

Friday, June 6

Hooding Ceremony for Masters and Doctoral Degree Candidates
1:30 p.m., Dee Glen Smith Spectrum

College of Science Open House 3:30-4:30 p.m.
Science-Engineering Research Building Patio

President's Reception 4:30-5:45 p.m.
David B. Haight Alumni Center

Graduation Dinner 6:00 to 8:00 p.m. (Tickets required)
Taggart Student Center, Evan N. Stevenson Ballroom

Collage of Sounds Concert 8:00 p.m., (Tickets required)
Chase Fine Arts Center, Kent Concert Hall

Saturday, June 7

Academic Procession 8:30 a.m.
Taggart Student Center University Quadrangle to Dee Glen Smith Spectrum

Commencement Ceremony 9:30 a.m.,
Dee Glen Smith Spectrum

College of Science Graduation Ceremony 12:00 noon
Taggart Student Center, Evan N. Stevenson Ballroom

Alumni Graduation Picnic 11:00 a.m. - 2:30 p.m.
University HPER Field (Tickets Required)

Alumni Reception 11:00 a.m.-3:00 p.m.
Open House in the David B. Haight Alumni Center

For additional information regarding Commencement, see <http://www.usu.edu/~edserve/commence97/>.

Golden Aggies 1947-1997

*Howard S. Beaudoin,
Howard and June Blood
J. Allen & Beth Campbell
Jack and Larae Chatelain
Roy C. Irick
W. Boyd Jacobsen
Linden J. Leatham
William R. Manning
A. Errol Nielson
G. Norene Pond*

College of Science Recognizes Outstanding Students

The three students profiled here reflect the well-rounded academic and personal lifestyle that we encourage in our College

Department of Biology



Bryan Whitmarsh, this year's outstanding student in the Department of Biology, is from Seattle, Washington. He is in his second year at USU after transferring from Ricks College, which granted a Spori scholarship for his perfect 4.0 GPA. This full scholarship may be used at any university in Utah or Idaho.

Whitmarsh developed an interest in science in his childhood when he watched "whizbang" science programs on TV (programs that show a scientific process, but don't show all the time and effort that goes into the research). He currently works with Dr. Greg Podorski on a gene cloning project. He divides his time between helping in the Biology Department and volunteering in the microbiology labs at Logan Regional Hospital.

After graduating from USU this coming June, Whitmarsh will continue his education at the University of Washington, where he will study medicine. Whitmarsh spent much of his childhood in hospitals because he was a very sick child. This frequent contact with the medical field instilled in him a desire to help others in the same way he was helped. Among his aspirations is a desire to specialize in trauma surgery, where he can see immediate results from his labors.

Whitmarsh lives in Logan with his wife, Shannon, and their three children. In his free time he enjoys fishing, skiing, hiking, and being with his family.

Chemistry and Biochemistry



This year's outstanding student in the Department of Chemistry and Biochemistry is Michael Chapman Granger. Originally from Maryland and a 1992 graduate of Saint Mary's College with a BS degree in chemistry, Granger became interested in chemistry while studying art. His undergraduate advisor directed him toward chemistry because of the ties of chemistry to art through paint mixing.

Granger worked for two years at Chesapeake Biological Laboratories, an environmental chemistry lab, then decided to return to school. After speaking with USU's Dr. Greg Swain, he decided to come here, both for the chemistry program and the geographic location.

He is currently completing a third year of graduate work with Swain toward a PhD in chemistry, with an emphasis on analytical chemistry and electrochemistry. Granger's doctoral research involves growing new diamond electrodes and he expects to graduate at the end of 1998. He likes research and hopes to teach undergraduate college courses.

Granger enjoys chemistry because it allows creativity. "It's a problem-solving science," he said. He also enjoys biking and rock climbing, as well as many other outdoor sports. While at USU, Granger has learned the secret of time management, allowing him to balance his academic work and recreation.

Computer Science



Scott Cannon, Jr., is this year's outstanding student in the Computer Science Department. Cannon has been attending USU since 1994 and will graduate in winter 1998 with a BS degree in computer science. He currently has a 3.9 GPA and is the recipient of a Presidential Scholarship.

Since June 1995, he has worked at the Space Dynamics Lab in the USU Research Park. He recently traveled to Sandia National Laboratories in Albuquerque, New Mexico, as part of a six-person statistical calibration group. While there, he helped collect data from the Sandia computers to prepare for pre-processing.

Cannon has always liked computers and started programming while still in middle school. He credits his father, Scott Cannon, Sr., a professor in the USU Computer Science Department and his favorite teacher, with interesting him in the field. He will soon become a member of American Computing Machinery, a club for computer science majors.

His plans include a career in computer graphics or parallel programming, a way of getting computers to do high-speed simultaneous problem solving.

In his spare time, Scott enjoys hiking and camping, as well as inventing new computer games. ♦

FAULTS

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recurrence intervals of 2,000-5,000 years. Over the years, the valley has experienced numerous small quakes that relieve pressure. While we don't usually feel these tiny, frequent quakes, this action lessens the pressure, possibly reducing our chances of experiencing a large earthquake.

The East Cache fault curves westward under Cache Valley. Where it flattens in the deep subsurface, it may join an older thrust-fault, somewhere near the valley's middle. Thus, Cache Valley is tilted, and rises to the west as the eastern part of the Wellsville Mountain block. Similarly, the Malad fault curves westward into the subsurface from its surface trace along the west side of the Malad Range. In an earthquake in 1975, that fault first broke several miles west of its surface trace, beneath Pocatello Valley. No surface break occurred at the surface trace of this fault or westward near the epicenter (surface area directly above the focus, or point of first break), because the focus was not near the valley margin. Cache Valley, with its similar fault structure, could experience the same type of earthquake.

Cache Valley and the surrounding region has a closed interior drainage and is called a basin-and-range province. This means that between two great faults, or ranges, a basin forms. The basin-and-range subsurface structure of this looks like dominoes that have fallen down on their sides. We see the bumps of the upper edge of each domino as our gently rolling farmlands and high, sharp mountains. The highest point of this basin-and-range lies near the Utah-Nevada line. All western water drainage flows toward Pyramid Lake in Nevada and eastern water drains toward the Great Salt Lake.

This basin becomes a trap for sediments from the many rivers flowing here. These sediments make rich and fertile farmland. After several million years, however, these sediments will fill the valley. The rivers will then erode through the mountain ranges and carry the sediments away, starting the whole build-up and erosion process over again. An earthquake, however, could accelerate this process dramatically.

Should such an earthquake occur, the old lakebed mud of Lake Bonneville poses the greatest danger to Cache Valley. The valley's high water table indicates the presence of this underground mud. Experts extrapolate from other quakes in similar regions that the flat farmlands of the Cache Valley could liquefy, similar to quicksand, during a quake of magnitude 5 or more, possibly tilting, or even swallowing, buildings and other structures. In a quake of 8 to 9, large pieces of the mountains could move down into the valley, causing extensive damage. The U.S. Geologic Survey, which rates fault zones in terms of danger, lists Cache Valley second only to the San Andreas zone.

Though researchers such as Evans and Oaks rarely get to witness geologic events of great magnitude, occasionally an opportunity to learn comes from unexpected sources. The data resulting from the Malad earthquake, combined with the seismic data from oil company exploration, are a boon to researchers. Public institutions often lack the funding necessary to collect and interpret the enormous amounts of data involved. Professors Evans and Oaks and the College of Science thank Amoco and Placid Oil for their generosity in releasing these data for use in research. ♦

Alumnet Responses

Carl H. Blank (MS 1957, microbiology) continued his education at the University of North Carolina at Chapel Hill, earning a doctorate in 1967. He is retired from the Centers for Disease Control and is currently acting director of the Association of State and Territorial Public Health Laboratory Directors, while a new executive director is recruited. He expects to be in Washington, D. C., for about six months.

Jeffrey M. Cox (MS 1995, physics) is living in Colorado Springs, Colorado, while pursuing a career in the United States Air Force.

John Aldon Cox (BA 1965, entomology) has a BA degree from The Evergreen State College in American literature. He works for the Centers for Disease Control and Prevention as the assignee to the northern region of the Commonwealth of Virginia and is the regional manager of the STD/AIDS program of the Virginia Department of Health. His wife, Candace G. Cox, works as the assistant vice president of human resources at the First Union Bank in Charlotte, North Carolina.

Stephen R. Crook (MS 1985, geology) is the senior geologist for Parratt-Wolff, Inc. He is the proud parent of three sons—Evan, Stephen, and Charles—and carries fond memories of USU and his graduate studies under the supervision of Professor Clyde T. Hardy.

Doug Dean (BS 1973, biology) has done a variety of interesting work: he was the western sales manager for Fort Dodge Animal Health; taught school in Norwood, Colorado; air quality controller, Salt Lake City, Kennecott Copper; and Beecham Labs until 1995 when SmithKline Beecham Animal Health was bought out by Pfizer Animal Health. In 1996, Fort Dodge hired Dean away and the family moved to Henderson, Nevada. He and his wife, Becky Henderson (USU 1973), have four kids and the whole family enjoys barefoot waterskiing. Their son, Danny, is the Western Regional Barefoot Champion.

David A. Dunn (BS 1993, MS 1996, computer science) works as an engineer for Hewlett Packard and lives in San Jose, California.

Walter Fox (BS 1950, botany) retired from the U.S. Forest Service in 1980 after 30 years where he served as regional silviculturist for the southern region. In 1981, he launched Fox Forestry, Inc., in northeast Georgia, a company that specializes in chemical site preparation, reforestation, and commercial weed and kudzu control and eradication.

Dr. Carl F. Friese (PhD 1991, biology, ecology) is a professor at the University of Dayton where he is helping develop and direct the Environmental Biology Degree Program. His research projects, funded by NSF and USDA, study desertification and productivity in arid ecosystems in Chili and the western United States. He lives in Centerville, Ohio.

Paul S. Goldy (BS 1989, computer science) has been the interna-

tional sales manager for Database Products/Extended Systems since 1989 and started out as a software engineer, migrating to marketing and sales as necessary and now travels two or three weeks every quarter to sell and promote their database software. He married Geneva Hawkins (BA/BS 1985, elementary education) in 1985 and they have three children. They miss the great skiing and the friendly people of Logan but are enjoying Boise.

E. Park Guymon (MS 1965, chemistry) is a professor of chemistry at Weber State University and has done extensive work on oil cleanup in the Vernal tar sands for which he has been awarded patents in the United States and Canada. He is also involved in high-tech lab production of asphalt and oil filter cleanup.

Lyle A. Hale (BA 1948, geology) earned an MS degree in geology from the University of Wyoming. He retired from Mountain Fuel in January, 1975, as vice president and manager of the Exploration Division after 25 years. He began consulting for major oil and gas companies in the Rocky Mountain Region and now operates a private trout ranch in Star Valley, Wyoming. Geological studies are still his hobby. He and his wife, Jeanette, have eight children and, at last count, 31 grandchildren, and live in Star Valley during the summer and in the redrock country of St. George during the winter.

O. Mark Heaton (BS 1982, geology) is a managing consultant with the consulting arm of Microsoft. He works with large organizations to help them use MS technology effectively. He has four children and lives on a 20-acre ranch in Idaho.

Ralph V. Hervey (MS 1940, microbiology) is a retired soil microbiologist for Texas A & M University. Now 83 years old, Hervey was born in Chicago. He worked in soil conservation in 1941, at Western Regional Research Lab (USDA) 1942-45, in Agricultural Research 1946-47, at the Brigham Bird Refuge (USDA) 1947-48, and was a professor of microbiology at Texas A & M from 1948-71.

John C. Lekas, MD (BA 1985, geology) continued on to earn a medical degree at Albany Medical College in 1995. He is currently a second-year emergency medicine resident. He is engaged to be married to Tina Le, an occupational therapist, and they plan to

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 Liz Anderson and Annie Lamon and Dean James MacMahon. Special thanks to Gene Underwood, Sue Morgan, and USU Photo Services for the photographs, to Linda Keith of Editorial Services, and to Kandy Baumgardner.

move to Arizona in 1998. He has a web site at <http://www.virtualer.com>.

John I. Mosher (PhD 1972, zoology) retired in 1992 after 32 years at SUNY Brockport, New York. He and his wife of 36 years, Connie, have four grown children and four grandchildren. John teaches workshops on stress reduction—finding inner peace—and remains active with various out-of-doors activities such as camping and hiking. Connie paints inner- and outscapes and both do Tai Chi Chaur.

Bruce T. Murdoch (PhD 1975, physics) is a health physicist for the Argonne National Laboratory. In 1996 he was designated a Certified Health Physicist by the American Board of Health Physics. This completed a successful three-year period of re-careering and relocation from Houston to Chicago after losing his job as manager of nuclear systems development for an oil field services firm in 1993, the result of corporate downsizing. He and his wife, Carve, are now living happily on the fringes of Chicago. He says he "is now an expert on how to change careers when the need arises."

Henry P. Nowak (MS 1981, biochemistry) is a biotechnology patent counselor for Swiss-owned Novartis Corporation, the second largest pharmaceutical company in the world. He recently married Debbie J. Ryan and they live in Summit, New Jersey.

Steven L. Rauzi (BS 1977, MS 1980, geology) is an oil and gas program administrator for the Arizona Geological Survey in Tucson. He is involved in a project to sample and describe hydrocarbon source rocks of the late Proterozoic Chuar Group in eastern Grand Canyon. Samples collected in 1996 are currently being geochemically analyzed. The AGS will establish a study collection of these inaccessible but important oil source rocks and release the results after October 1997.

Charles Robinson (BS 1949, math and physics) went on to earn an MS degree in 1951 and taught school from 1950 to 1966. He

was school principal from 1951 to 1953, and a Hill AFB mathematician after 1966. He served on the State Math Curriculum Committee to rewrite trigonometry books during the summer of 1959 and again in 1962. In October 1980 he got his building contractor's license. Robinson and his wife, Marie, live in Ogden, Utah.

G. Fred Somers (BS 1935, botany), listed in *Who's Who in America*, was honored as a Rhodes Scholar in 1936. He earned a Bse degree in 1939 from Oxford University and a PhD from Cornell in 1942. He is presently Professor Emeritus of biological science at the University of Delaware. In 1939 he married Beulah, who is the sister of alumnus Elmo Wayne Morgan (BS 1934). Fred and Beulah have three sons.

Brett South (BS 1995, biology and political science) lives in Columbia, Maryland, and works for Westat, Inc., as a biostatistics analyst for studies in national health care trends.

Sarah Thornell South (BS 1996, biology) is currently living in Columbia, Maryland, while pursuing a doctoral degree in human genetics at Johns Hopkins School of Medicine.

Lillian D. Wakely (MS 1976, geology) earned a DEd degree from Pennsylvania State in 1984 and is now chief of the engineering geology branch of the U.S. Army Waterways Experiment Station. Lillian and her husband, James (PhD 1976, wildlife ecology), are scientists at the U.S. Army Corps of Engineers principle research laboratory in Vicksburg, Mississippi. James is senior researcher in the wetlands branch.

Yaming Wu (MS 1990, biochemistry and molecular biology) has worked in the biotech industry for six years and is now senior scientist in charge of virology at Fiji ImmunoPharmaceuticals Corporation. His wife, Meixiong Wu (PhD 1992, cell biology) is an instructor at Harvard University. They have two children—Kevin (who was born in Logan) and Jeffrey—and they live in Lexington, Massachusetts. They would like to visit USU this year. ♦

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