CHAIR’S REPORT

Patricia H. Kelley

The 1993-1994 academic year was a traumatic one for the Department of Geology and Geological Engineering. Perhaps you recall that, as we went to press last year, the Department had just received the Vice President’s proposal for reorganization and reallocation within Academic Affairs. Included among the recommendations were the elimination of the Geology PhD program, the Geological Engineering program, merger of our department with the Geography Department, and elimination of a separate Geology Library.

I am happy to report that none of the proposed changes occurred. After months of attending meetings and writing memos, we learned last spring that our Department, its programs, and the F.D. Holland, Jr. Geology Library would remain intact. Many alumni, and especially the members of the Alumni Advisory Council, wrote letters or spoke with members of the administration. I have no doubt that this alumni support was key to the support of our programs and the library.

Amidst all the turmoil, the Department made significant strides in the area of program enhancement. We continued improvements to the Geological Engineering program in anticipation of the ABET accreditation evaluation to be conducted this December. A new curriculum went into effect in Fall 1993, with an enhanced engineering design component. These changes have improved the Geological Engineering program significantly.

Several changes in faculty have also occurred in the Geological Engineering program. We regretted the departure of Min Chu, who resigned from the faculty in December after 11 years of faithful service to accept a position in energy engineering with the State of California in Bakersfield. Fortunately, we were given permission to fill his position (quite an accomplishment, considering UND budget cuts). Dr. Scott Korom has just joined the faculty; his experience is in the area of groundwater contamination and remediation. His expertise will strengthen further the Department’s increasing involvement in environmental aspects of geology and geological engineering.

We have begun the process of reviewing our graduate programs, with the impetus of the Provost's restructuring recommendations and the results of a Graduate School program review. We have begun to review graduate course offerings, admissions policies and program emphases. Action will be taken in these areas in Fall 1994.

Faculty of the Department of Geology and Geological Engineering have long been recognized for excellence in teaching. In the past few years, research accomplishments have also increased. Most faculty published in refereed journals during the past year, and the Department has several major competitive grants (see accompanying articles). These grants have provided support for several graduate students during the past year.

The Department has begun to develop a Water Quality Laboratory. A preproposal for this laboratory was selected by UND for development and submission to NSF’s Research Instrumentation Acquisition Program. Word was received in mid-September that NSF will provide nearly $200,000 in support of this lab. Funding for the laboratory will also be sought from a consortium of industry and municipalities. Contributions from alumni for the Water Quality Laboratory would also be most
welcome! The laboratory will be housed on the third floor of Leonard Hall, in space recently vacated by the Energy and Environmental Research Center (EERC). The remaining EERC space is being temporarily occupied by personnel from Computer Services while the former Medical School (south) is being renovated for them. The expectation is that they will vacate Leonard Hall in about 18 months. Who knows what will follow.

Other highlights of the past year include another successful LEEPS (Leading Edge of Earth and Planetary Sciences) Lecture Series, which brought 11 nationally eminent scholars to campus. During Homecoming 1993 the Department awarded Leonard Medals to alumnus Andy Alpha and professor emeritus Bud Holland in recognition of their contributions to the geosciences.

Our programs continue to increase in enrollment, and our faculty have continued their records of excellence in teaching, research, and service. It was a difficult year, but I believe the Department has emerged stronger from the turmoil. We are thinking more carefully about what we do, and we have all worked together to defend and enhance our programs. But we could not have been successful in this venture without alumni help. Thank you, alumni, for your loyal and faithful support!

ANDY ALPHA AND BUD HOLLAND
Recipients of the 1993 Leonard Medal

October 1, 1993, was the day set aside to honor Andy Alpha and Bud Holland at UND. J. Mark Erickson (MS '68, PhD '71) presented a noon testimonial lecture, "Fossil oribatid mites: how "good" is their geologic record? What "good" is their geologic record?"

Andy receiving award. Joni was a citationist. (F. D. "Bud" Holland, Joni Lerud, Tricia Kelley, and Andy Alpha)
The evening banquet at GF Goodribs was followed by the presentations to Andy and Bud, with Sid Anderson and Joni Lerud making comments about Andy, and John Hoganson and Rod Feldmann citing their appreciation of Bud. Both Andy and Bud expressed humility and delight for the honor in their acceptance speeches. Others attending the ceremony included:

Rod & Barb Feldmann
Marcella Melsted
Roger & Jan Schmid
Ken Brinster
R. L. McKenzie & Luverne
Tom and Mary Sand
Larry & Ida Heuchert
Ron MacCarthy
Ed Murphy
Ken & Elsie Wilkie
John W. Hoganson
Joanne Lerud
Mr. & Mrs. Elbert Van Ornum
Mr. & Mrs. Andy Alpha
Dr. & Mrs. Richard Lefever
Sid & Mary Anderson
Gary Winbourn
Joe & Jane Hartman
Jonathan & Patricia Kelley
Joel & JoEllen Kusmaul
Rachel M. Davis
Mogens & Terry Henriksen
Cal Taylor

Dr. & Mrs. F. D. Holland, Jr.
Ilene H. Lee
Nels F. Forsman
Kelly Carlson
John & Barbara Reid
Wes Peck
Liza Powell
Milton & Hilda Mae Lindvig
Frank & Joan Karner
Del Holland
J. Mark Erickson
David & Alice Brekke
Marv & Ragnhild Rygh
John Bluemle
Dorothy Laird Kaatz
Jim Berg
Phil Gerla
Ronald Matheney
Karen Katrinak
Gloria Pederson
Louise Robertson
Min Chu

Bud Holland receiving A. G. Leonard Award from Tricia Kelley
BRUNO HANSON AND SID ANDERSON
LEONARD MEDAL RECIPIENTS

Upon the occasion of the Fall 1994 Homecoming, October 14, two nationally (and internationally) known alumni were awarded the Leonard Medal for outstanding contributions in the geosciences and to the Department. Lee Gerhard and Walt Moore were among the many who returned to pay tribute to these new awardees:

SIDNEY B. ANDERSON: (PhB '51). Sid's knowledge of the geology of the Williston Basin is unparalleled. His research is documented in an extensive series of publications dating to 1954. Many of these contributions are co-authored with other North Dakota Geological Survey personnel or with UND students, for Sid willingly shares his knowledge with countless individuals. Over the years, numerous UND students have received guidance from Sid on their theses or class projects. A few years ago the graduate students and Sigma Gamma Epsilon presented Sid with a special award of appreciation.

In addition to this informal service through mentoring, Sid also has served the profession through work with the Interstate Oil Compact, the North Dakota Geological Society, and the American Association of Petroleum Geologists (serving AAPG on several committees, including the Constitution and Bylaws Committee and the Core and Sample Preservation Committee, which he still chairs). Sid's service to UND includes membership on the Department's Alumni Advisory Council.

Sid's thirty-nine years with the North Dakota Geological Survey earned him the appreciation of probably thousands of people who came to him for help in interpreting the geology of the Williston Basin. It has been said that "everyone likes Sid Anderson," and that in itself is a testimony of who Sid is. The Department of Geology and Geological Engineering is proud to recognize Sidney Anderson with the Leonard Medal.

BERNOLD M. (Bruno) HANSON: (BSGE '51, MA (Wyoming) '54, Honorary Doctorate (Wyoming) '87). Bruno's professional experience includes work with the U.S. Geological Survey in Grand Forks, the U.S. Army Corps of Engineers (Alaska and California), Magnolia Petroleum Company (Midland, Texas), and Humble Oil Company (New Orleans, Alaska, and Midland). Since 1960 Bruno has been a consulting geologist, founding the Hanson Corporation, an independent oil company, in 1966.

Bruno was recognized as the "All-American Wildcatter" in 1968 and his stature in the profession is indicated by the numerous offices he has held in such
organizations as the American Institute of Professional Geologists, the American Association of Petroleum Geologists, and the Society of Economic Paleontologists and Mineralogists. Most notable, he served as President of the AAPG between 1986-1987, and organized and was founding president of the AAPG Division of Environmental Geosciences.

Bruno’s service to UND has included serving on the Board of Directors of the UND Alumni Association and the UND Foundation, of which he was President in 1984. He has also served on the Department’s Alumni Advisory Council. For his loyalty and service to the University, Bruno was honored by the Sioux Award in 1968, and the North Dakota National Leadership Award of Excellence in 1988. Bruno’s work with the Boy Scouts of America have earned him the Silver Beaver Award, the Distinguished Eagle Scout Award, and the Silver Antelope Award.

The Department of Geology and Geological Engineering is proud to recognize Bernold (Bruno) Hanson with The Leonard Medal.

**NOMINATIONS INVITED**

Alumni and Friends of the Department of Geology and Geological Engineering: We seek your help in nominating deserving candidates for the Arthur Gray Leonard Award! The Award Committee, consisting of faculty and alumni, is appointed by the Department to seek and review nominations and then recommend candidates for the Leonard Medal.

We invite your nomination(s), or joint nomination(s) with others, at any time. We will review your nomination(s) for all future Leonard Awards. To date the Department has presented Leonard Medals at the 1992 and 1993 Fall Homecoming Banquets. Sid Anderson and Bruno Hanson received Leonard Awards on October 14, 1994. Award criteria are summarized in the following formal description from the Departmental plaque displaying the Leonard Medal and commemorating individual recipients.

"THE LEONARD MEDAL"

"Established in 1992 in honor of Arthur Gray Leonard (1865-1932), scholar, leader, and pioneering geologist of North Dakota. Award of the medal recognizes outstanding achievement in the geosciences in research, technical studies and projects applied to societal needs, teaching, educational development, or leadership in conservation of Earth's resources and environment. Conferred by faculty and alumni of the Department of Geology and Geological Engineering, University of North Dakota."

Previous recipients include:

1992 - Wilson M. Laird for "Leadership-Education-Service"

1993 - Andrew G. Alpha for "Conservation-Exploration-Service"

1993 - F. D. Holland, Jr. for "Scholarship-Education-Service"

Please submit nomination(s), including your summary of nominee achievements which meet award criteria, to the committee at any time. For consideration for the proposed Fall, 1995 award(s), please submit by January 31, 1995. Nominations
will be retained for later consideration if not chosen for this coming year. Thank you! Frank R. Karner for the A.G. Leonard Award Committee: Sid Anderson, Kelly Carlson, Bud Holland, Frank Karner, Patricia Kelley, Milt Lindvig, Ed Murphy, John Reid.

------------------------------------------------------------------

LEONARD MEDAL NOMINATION

I nominate________________________

This alumnus is especially worthy of this recognition because:
(be sure to sign this nomination and mail it directly to the Department; it would be helpful if you could obtain other supporting signatures)
Seen at the NDGS Quaternary Mapping Workshop
Sept. 27-28, 1993
Bismarck, ND
John Bluemle (led glacial field trip)
John Hoganson (led dinosaur site field trip)
Ken Harris (presented progress on his mapping)
Mark Luther (presented GIS progress)
John Reid

Seen at the AMQUA Biennial Meeting
June 19-25, 1994
University of Minnesota
Lee Clayton
Ken Harris
Howard Hobbs (led 2-day field trip)
Gary Meyer (led one-day canoe field trip)
John Reid
Julie-Ann VanNest

Seen at the Boston GSA Meeting
October 1993
Allan Ashworth
Palmer Bailey
Jim Bauer
Steve Chipera
Crawford Elliott
J. Mark Erickson
Nels Forsman
Lee Gerhard
Will Gosnold
Tom Gustavson
Thor Hansen
Joe Hartman
John Hoganson
Bud and Mardi Holland
Pat Videtich

Frank Karner
Alan Kehew
Tricia Kelley
Tim Kroeger
Joni Lerud
Ed Murphy
Linda Oakes
Darryl Pederson
Dexter Perkins
John Reid
Mark and Symma Rich
Mitch Schulte
Mary Scott
John and Christine Tinker

Seen at the AAPG Meeting
Denver (June 1994)
Sid and Mary Anderson
Sid Bjorlie
Kipp and Danette Carroll
Charlie Cook
Wally and Marlys Dow
Wayne Freisatz
Lee Gerhard
Gary Hall
Steve and Mary Harris
Kent Johnson
Julie LeFever
Pete Loeffler
Fred O'Toole
Steve Sturn
Laramie Winczewski
RECENT GRADUATES

August, 1993 Geology Graduate

Wenker, Grant (BS) - South Dakota School of Mines & Technology (MS program)

December, 1993 Geology Graduates

Brown, Paul (BS) - University of Idaho (graduate school)
Evans, Brian (BA) - Havre, MT - will attend school next semester

December, 1993 Minor in Geology

Abell, Paul - UND (Graduate School) Geology
Mattson, Steven - UND Law School
Neuharth, Steven - UND EG&T program
Trautman, Angela - Killdeer, ND - gaming dealer

December, 1993 Geological Engineering Graduates

Hopfauf, Scott (BSGE) - Mandan; insurance adjuster/contracting
Kuta, Cindy (BSGE) - Interpol Lab, Inc., Mpls. (engineer)
Votava, Jeanie (BSGE) - Westinghouse Hanford Co., Richland, WA

December, 1993 Environmental Geology & Technology Graduates

Frison, David (BS) - interviewing
Kouba, Jennifer (BS) - USDA-SCS Lincoln, NE
Kurz, Marc (BS) - UND EERC
Larson, Grant (BS) - Fargo Consulting Company
Peabody, Timothy (BS) - unknown
Skibicki, Patrick (BS) - ND State Health Dept., Bismarck

May, 1994 Geology Graduates

Brevik, Eric (MS) - CHART Services, Inc., Urbandale, IA
Lucy, Sean (BS) - Powers Lake, ND
Schumacher, Tina (BA) - interviewing
Wetmore, Michael (MS) - Wetmore Drilling Co., SD

May, 1994 Geological Engineering Graduates

McNaboe, Kale (BSGE) - Huntingdon Engineering & Environmental, Inc., Bismarck
Schaner, Ryan (BSGE) - Baker & Assoc., Scottsbluff, NE

May, 1994 Environmental Geology & Technology Graduates

Abercrombie, Harry (BS) - unknown
Harwell, Stacy (BS) - Braun Intertec, Minneapolis
Myerchin, Paul (BS) - UND Law School

August, 1994 Geology Graduates

Alme, Karyn (BS) - UND (Graduate School) Geology
Gerlach, Tim (MS) - UND EERC
McDonald, Mark (MS) - Sverdrup Envir. Inc., St. Louis, MO
Sahl, Barb (MS) - West Poik Soil and Water Conservation District, Crookston, MN
Taylor, Cal (MS) - interviewing

August, 1994 Geological Engineering Graduates

Tveter, Jason (BSGE) - Tempe, AZ

August, 1994 Environmental Geology & Technology Graduates

Botnen, Barry (BS) - unknown

THESES/DISSERTATIONS


1994 McDonald, Mark, (M.S.) A high resolution gravity survey for the detection of Pleistocene Aquifers underlying the Fort Berthold Indian Reservation, North Dakota. Chairman: Will Gosnold.


SCHOLARSHIPS AND AWARDS

1994-95

Estwing Pick Award
Michele DeWeese

C. Burt Folsom Memorial Scholarship
Joey Davidson

Bernold M. Hanson Scholarships
Joey Davidson
Donald Forsman
Bryan Zinda

Henry Hinds Scholarship
Sherry Samson
Reba Laird Scholarships
Karyn Alme
Carissa Munson

Hugh and Ruth Palmer Scholarships
Michele DeWeese
Taunya Ernst
Angela Hedgecough
Todd Holweger
Kyle Johnson
Patricia Kleven
Andrew Kuchera
Darren Miller
Chris Rousseau
Scott Sickler
Steven Smith
Brent Stafford
Nathan Wilkens

Emil and Audrey Stoltz Geological Engineering Scholarship
Bernard Lenz

Ernest Tisdale Memorial Scholarship
Lee Evans

Charles H. Waldren Scholarships
Joel Galloway
Darrin Pagnac

DESSERT SOUTHWEST
Association of Undergraduate Geologists
Spring Break Field Trip

The trip began March 12, 1994, six eager students and a daring professor, Dex Perkins. The final snow melt had just concluded at our arctic (or so it seems in March) latitude. We were all anxious to leave the bleak plains of North Dakota in search of sun, sand (although in the lithified state), and a little relaxation.

First stop, Las Vegas. No time for gambling, there were bags to fetch and vehicles to rent. It was about eleven in the evening when we finally got on the road and the moon was hidden behind a shroud of thick clouds. If you have ever been in the desert on a cloudy night you’ll know the eerie sense of darkness that abounds. As we left the lights of Las Vegas behind, our destination was yet unclear and it appeared as though we were on the road to nowhere.

After a three-hour drive to the northeast, we decided to call it quits for the evening. We came upon a nice campground located in the Valley of Fire, Utah. Still unaware of what surrounded us, we made camp and turned in for the night. Morning came sooner than expected. I awoke at about six a.m. and was immediately impressed with the landscape. The sun was bright and very large as it crept over the towering red cliffs of sandstone. It was a truly remarkable sight, and was exactly what I had come for.

The next few days were filled with the most spectacular sights one could possibly imagine. There were the sheer cliffs of Zion National Park, the
towering spires of Bryce Canyon (still laden with snow), and the unbelievable collection of landforms at Arches National Park. By the end of these few days we were tracing the seemingly never-ending Dakota Sandstone, Morrison Formation and Entrada Sandstone from park to park.

One stop on our agenda was just outside of Arches National Park in a little town called Moab, Utah. The purpose of this visit was to experience the Slickrock bicycle trail. Sure, the area around Moab is full of nice off-road trails but Slickrock is the granddaddy of them all. Twelve and a half miles of polished sandstone dunes that are, to say the least, not for the timid. After losing four out of the seven beginning riders, the remaining three (including myself) conquered the course. It was the most difficult five hours of cycling I've ever done and I'm sure my counterparts would agree. We all felt a sense of accomplishment after the journey and hated to leave Moab, but time was against us. In two days we would be on a flight from Las Vegas to Grand Forks.

In looking back on the trip, I would conclude that the desert southwest is one of the most unique and diverse landscapes the US has to offer. It certainly left a strong impression on me as I am sure it does to all who visit there. In conclusion, I would like to thank the Department of Geology, the Student Activity Council and the Association of Undergraduate Geologists for their gracious funding for this trip. These trips would not be realized without your support. The following quote is from Edward Abbey's book "Desert Solitaire" and helps summarize the processes at work in the desert southwest. "At first look it all seems like a geologic chaos, but there is method at work here, method of a fanatic order and perseverance: each groove in the rock leads to a natural channel of some kind, every channel to a ditch and gulch and ravine, each larger waterway to a canyon bottom or broad wash leading in turn to the Colorado River and the sea."

- Steven A. Smith
President AUG

![Photo of five people, including Joel Kuszmaul, Ken Sanstead (Mining Engr. '44, Golden Graduate), Patricia Kelley, Bob Jeffries (Mining Engr. '49), John Reid.](UND Alumni Foundation photo)
RECENT DEPARTMENT PUBLICATIONS


Majorowicz, J., Gosnold, William, Jessop, Alan (1994) Interpretation of Temperature-depth Logs from Boreholes in Manitoba and Saskatchewan, GAC-MAC Annual Meeting, Waterloo, ONT.


Matheney, R.K. and P.J. Gerla: Environmental isotopic evidence for the origins of ground and surface waters in a prairie discharge wetland. WETLANDS (U.S. Fish and Wildlife Service). Submitted 7-7-94.


The Department of Geology and Geological Engineering is deeply indebted to all alumni who show their loyalty to UND by sharing their financial success with us. Contributions are increasingly important to us, as our appropriated budget probably will be cut again this coming biennium! We are suffering less than most other departments at UND because of the generosity of our loyal alumni. Thank you for remembering us! Two of the many funds that you might consider are the Alan M. Cvennara Graduate Research Award (which is still below the minimum necessary in making awards) and the Water Quality Lab (which has just received funding to initiate its development).

**Honor Roll of Patrons**

In order to recognize and honor contributors to the Department of Geology and Geological Engineering, the Geology Alumni Advisory Committee has designated the following categories: Life Patron--$10,000; Honor Patron--$5,000; Sustaining Patron--$1,000; Patron--$500. All contributions to the Department are accumulative and applicable toward the next larger category. Many companies match, or double or triple match your contribution. Gifts may be sent directly to the Department or channeled through the UND Alumni Office to any Department fund, or the Geology Development Fund and may be designated for a specific purpose, if the donor so chooses. You may be assured that your donation will be used for the purpose you designate. To express our continued appreciation and gratitude for their generous gifts to the Department, the names of our Patrons will be listed in each issue of the Alumni News.

**Life Patron ($10,000):**
Dr. & Mrs. Thomas Hamilton
Bernold M. Hanson
Dr. & Mrs. F. D. Holland, Jr.
Dr. Wilson M. Laird
James W. McKee
Hugh and Ruth Palmer

**Honor Patron ($5,000):**
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Mr. & Mrs. Charles Cook
Joseph Sabo
Emil & Audrey Stoltz

**Sustaining Patron ($1,000):**
Mr. & Mrs. Robert K. Aaker
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DONATIONS

We are pleased to acknowledge recent donations to the Department. These are always appreciated (If you can't send money, send us other types of donations; if you can't do that, send us your news!)

Ron MacCarthy (ex MS '71), Captain with the Grand Forks Police Department, in charge of patrol officers, donated a magnificent collection of Recent marine invertebrates to Bud Holland, who, in turn, donated them to the Department. They will be especially useful in the paleontology courses. Thank you, Ron!

Ken Brinster and Ron MacCarthy at A.G. Leonard Award gathering.

FOSSIL COLLECTION GIFT OF BEACH FAMILY

The Department of Geology and Geological Engineering has received an extensive collection of invertebrate, vertebrate, and plant fossils as a donation of Mr. and Mrs. Alan B. Beach of Cincinnati, Ohio. Alan Beach is retired as a metallurgist from the flight propulsion division of the General Electric Company in Cincinnati where he worked on titanium steel for jet engines and rocket cases. Together with his wife he operates the A & A Stamp Co., specializing in stamps for philatelists that illustrate botanical, zoological, and geological subjects. Dr. Patricia Kelley, Chairperson of the Department, expressed her gratitude to the Beaches saying, "The collection represents an extremely valuable addition to our paleontology teaching collection."
Alan and Anita Beach and their children amassed this large collection on family field trips spanning three decades beginning in the late 1950s. The Beaches’ interest stemmed from trips and association with the "Dry Dredgers," a club of amateur fossil collectors founded by the late Kenneth E. Caster, paleontologist at the University of Cincinnati. Localities within the city of Cincinnati and the surrounding area are famous worldwide for the abundant marine fossils to be found there. As their knowledge of fossils and their experience in collecting them grew, the Beach family enlarged their area of collection to include neighboring states and areas as far as Wyoming.

The gift came as a result of a conversation of Professor Emeritus F. D. "Bud" Holland with Anita Beach at the A & A Stamp Co. booth at TOPEX '93, the national exhibition in Milwaukee in June of 1993 for thematic stamp collectors. While they discussed fossils on postage stamps, Anita mentioned Dr. Caster and the "Dry Dredgers" and Bud learned the location of the Beach collection. Anita shared that they were searching for a permanent location for their collections where the fossils could be used in teaching. Because of Bud’s association with Dr. Caster while at Univ. Cincinnati, UND was selected for this collection. As they say, "The rest is history." Bud arranged for the gift and, together with alumnus J. Mark Erickson, drove Holland's pickup to Cincinnati in June of this year. At the Beach home they wrapped and boxed the specimens, loaded them and a large storage cabinet into a rented trailer, and hauled them to UND where Plant Services personnel moved the specimens into the paleontology laboratory in Leonard Hall.

The gift complements the Samuel J. Tuell Collection of rare fossil specimens given to the University in 1965. The A. and A. Beach Collection is valuable for several reasons. The collections from various localities are extensive because the Beaches were able to return to these localities numerous times. Thus, the collections are complete enough for biometric (statistical) analyses of ancient populations. Secondly, some of these prime localities are now inaccessible (grassed over or blacktopped for parking lots). Thirdly, the Beaches were very discerning collectors; they had good eyes for spotting excellent specimens. Included in the collection are hundreds of trilobites and edrioasteroids from beds of the Ordovician at Cincinnati; whole faunas from the Silurian Waldron Formation at St. Paul, Indiana; Middle Devonian faunas from Sylvania, Ohio, and Speed Quarry at Jeffersonville, Indiana; blastoids from Mississippian beds near Berea, Kentucky; and fronds of Pennsylvanian age seed ferns from Indiana coal mines. Wyoming fossils include several kinds of exquisitely preserved fossil fish from ancient lake beds of the Eocene Green River Formation. UND previously had very few edrioasteroids or blastoids in the collections and the silicified specimens from Speed Quarry are so delicately preserved that brachiopod shells still retain the spiralum within the shell -- excellent for demonstration purposes.

Some extremely important localities are represented by the collection. Our students will benefit greatly from having access to this material. As finances permit, we will put some of these fine specimens on exhibit in the lobby-museum of Leonard Hall for the public to view, as well.

Our sincere thanks to the Beach family and to Bud Holland and Mark Erickson for enabling UND students to benefit from this collection.
Introducing

SCOTT F. KOROM

GEOLOGICAL ENGINEER JOINS FACULTY

Scott Korom is the Department's newest faculty member, coming to us from Westinghouse Savanna River Company, Aiken, SC, where he has been a Post-doctoral Research Fellow for the Department of Energy. Scott was born and raised in Akron, Ohio, graduating from the University of Akron (cum laude) in Civil Engineering (1982). He remained there through his Master's degree, graduating two years later. His thesis was Optimal design of internal energy dissipators for culverts operating under inlet control.

Upon graduation, Scott was hired as a consultant with Computer Modeling, Inc., assisting in developing models for the municipal water distribution systems, and then as a lecturer for the University of Akron, teaching Statics and Hydraulics laboratory courses. Scott entered the graduate program at Utah State University in the fall of 1986. While there he was a Research Assistant on a USGS project characterizing and modeling salt diffusion from the Mancos Shale underlying an irrigated field. That project was the beginning of his interest in ground water. He graduated with a Ph.D. in Civil and Environmental Engineering in 1991. His dissertation was Denitrification in the unconsolidated deposits of the Heber Valley Aquifer.

Scott spent the following year as a Research Engineer on the first Superfund site approved for testing in situ bioremediation of contaminated ground water (Libby, MT). His two subsequent years at the Savannah River Site have been concerned with developing a strategy to use field-scale tracer tests to determine physical and chemical properties of contaminated aquifers that require remediation. These experiences, several excellent publications, his progress toward professional certification, his outstanding letters of recommendation, and a strong interview, made Scott our choice for the authorized position in Geological Engineering. We look forward to his contribution to the Department, especially in the area of ground water engineering. Welcome, Scott!
FORMER FACULTY UPDATE

Terence T. Quirke, Jr.
1958–1960

Where did you go after leaving UND? The International Nickel Co. of Canada, Ltd.

What are you doing now? Genealogical research, mainly in Canada, Ireland, and the United Kingdom, doing business as Quirke, Quirke, and Associates.

What about your wife? She is retired.


Terence kindly donated a very special item to the Department this past year...A.G. Leonard’s Sigma Xi key, awarded to Dr. Leonard by the North Dakota Chapter in 1919. Upon Leonard’s death, the key was given by Mrs. Leonard to Terence’s father, Dr. Terence T. Quirke, professor of Geology at the University of Illinois. It was because of the close relationship of Dr. Quirke and Dr. Leonard; Dr. Quirke’s eldest daughter was Dr. Leonard’s godchild. The key will be displayed along with Leonard’s desk and other of his items in the Conference Room of Leonard Hall. Thank you for this gesture, Terence!

Mark Rich
1959–1963

Where did you go after leaving UND? I joined the faculty in the Department of Geology, University of Georgia, teaching and doing research especially in carbonate petrology. I retired from there in 1990, as Professor Emeritus.

What are you doing now? I was elected to the Clarke County Board of Education in the very first election of board members in the Fall of 1993. That job occupies much of my time. In addition, I have been a consultant in environmental geology, teaching evening classes, advising in the University Honors Program, and coaching youth basketball and little league baseball.

What is Symma doing now? Symma’s job as a first-grade teacher consumes more and more time each year as reorganization to a management format has developed. Symma participated in the GSA’s Boston Bravo Chorale, followed by a performance of Mozart’s Requiem at the New England Conservatory of Music.

What are your children doing? Todd flies for American Airlines and for the Air Force Reserve. He lives in Chicago. Jon works for Accu-Tech, an electrical and electronic cable supply firm in Tampa. Jordana is a free-lance writer, preparing advertising newsletters and brochures, and also works at the National Reading Research Center at the University of Georgia. David is in the 10th grade and plays trombone in the marching band and pep bands. Daniel is in eighth grade and plays trumpet and baseball.

Anything else to add? In midwinter, 1959, Symma and I travelled by coach railroad to Grand Forks from Urbana, IL, for my interview at UND. After a long, relatively sleepless ride, we arrived to a snow-covered depot. A lone figure was there to meet us, Bud Holland, who took us to the Dakota Hotel. After the interview, Bud waved goodbye to us at the same station. As the train gathered speed, Symma turned
to me and asked if I thought I would accept an offer. When I answered that I probably would, Symma burst into tears and cried all the way to Illinois! Four years later, as we were leaving to accept a position at Georgia, Elvina Moore (Walt's partner) stood outside her home and waved goodbye, Symma immediately broke into tears and cried all the way to Georgia! She and I would miss Grand Forks and all the true friends we made. UND was my first academic job and Symma began her public school teaching there. It was a special time in our lives and the friends we made there are still among our best.

Arthur Reesman
January 1962–June 1963

Where did you go after you left UND? I returned to the University of Missouri to complete my PhD and in the Fall of 1966 began 1 1/2 years at Western Michigan University before joining the Geology Department at Vanderbilt University. There, I "rose" through the ranks to Full Professor, teaching and doing research in geochemistry, primarily.

What are you doing now? I'm moving toward retirement at recently acquired property south of Nashville. We plan to develop the five acres, with the house sitting on a hilltop, into a bed and breakfast home. We need to get a road built first! Keep Blueberry Hill in mind if you come through Franklin.

What is Joan doing? Joan has retired from nursing and is busy being a grandmother and planning the Bed and Breakfast home.

What about your children? Bill (28 yrs) is selling real estate. Jon (26 yrs) is a Captain in the U.S. Air Force, piloting Air Force brass all over the country in a Lear jet. Amy (24 yrs), after avoiding Vanderbilt as an undergraduate, is now a master's candidate in geology there.

Anything to share about your time at UND? I cherish the 1 1/2 years I spent in the Geology Department at UND because of the cordial faculty colleagues and hard-working graduate students. I continue to be delighted at the many familiar names in the Alumni News. (We must have done something right!) Those were good times!

David B. Johnson
1978–1980

Where did you go after leaving UND? Department of Geoscience, New Mexico Institute of Mining and Technology, where I have been involved in teaching historical geology, paleontology, stratigraphy, carbonate petrology, and depositional systems, and conducting research in bionstratigraphy of conodonts, and diagenesis (using stable isotopes).

What are you doing now? In addition to my teaching and research, I assumed the duties of Chairman in 1993.

What is your wife doing? She is involved in landscape design and is the greenhouse manager for the University.

What are your children doing? Eric (24 yrs) is working and is a part-time college student in Los Angeles. Matt (22 yrs) is a senior in Environmental Science at the University of California–Santa Barbara. Audrey (6 yrs) is a first-grader in here in Socorro, NM.
Anything else to share? My major disappointment was having a "Full Glotkin" snatched from my grasp by Walt Moore!

Alan E. Kehew
1980-1986

Where did you go after leaving UND?
Department of Geology, Western Michigan University, where I attained the rank of Full Professor in 1990. I continue to teach Hydrogeology, Hydrogeochemistry, Glacial Geology, and Geomorphology. My research emphasis has been on catastrophic glacial outburst floods and ground water quality.

What else are you doing? I chaired the North-Central Section, GSA, when it met in Kalamazoo this past Spring, am co-editing a volume of papers for Quaternary Science Reviews, and a revised edition of my book, Geology for Engineers and Environmental Scientists, is due to be released this Fall.

What is Kay doing? Kay is working part-time as staff development coordinator at a nursing home here.

What about your children? Our twin daughters are both 26. Melissa is a nanny in Freeport, Maine. Michelle has also moved to Maine and may become a nanny, too. She was married last year to a Western Michigan University graduate in industrial design. Elizabeth is 10 years old and in the 5th grade.

What else would you like to say? I have many pleasant memories of UND, some of the best of which involved field work all over North Dakota (even though much field time was spent at landfills and sewage lagoons!) My very best wishes to all the alumni who were at UND when I was there.

F.D. (Bud) Holland, Jr.
1954-1989

Mardi and I, while on the way to the GSA meeting in Boston this past year, visited Erik and Susan in Williamsburg, VA, where they are both costumed interpreters of history to the public, she in Colonial Williamsburg and he in the Native American village at the Jamestown Settlement. We visited Del and family in Iowa City several times, once to witness oldest grandson Shane’s graduation from high school. I revisited UND’s Triceratops collecting site (22 yrs after its discovery) and have prepared observations on that specimen for publication. Mark Erickson (MS '68, PhD '71) and I travelled to Cincinnati to bring the A. and A. Beach Paleontological Collection to UND (see Donations), and then attended the American Topical Association national convention of topical or thematic stamp collectors in Omaha. Between the two of us we have about 93% of the nearly 1300 world postage stamps that portray fossils or reconstruction of prehistoric organisms! Afterward, we met John Hoganson (PhD '85) in the field for collection of Fox Hills shark’s teeth.
But the most exciting event of the year for me was the award to me of the A.G. Leonard Medal by the Department. I was completely surprised and nearly overwhelmed by this honor. I extend my gratitude to all my former students and colleagues who have made my 40 years with UND exciting and rewarding!

FACULTY NEWS

Phil Gerla and Will Gosnold were selected as Summer Fellows in Earth System Science at UND. Phil worked on "Relationship of stream, lake, and wetland nutrient-loading to climate change in the northern Great Plains". Will's project was on the "Climate history of the Midcontinent". Phil's involved the hydrology of prairie potholes.

Nels Forsman was awarded a Summer Graduate Research Professorship to work with Tim Gerlach on a possible impact structure in Renville Co. and with Curt Rockwell on fingerprinting the Knife River Flint.

NELS FORSMAN: It's been an interesting past year. Last fall I introduced a new course in economic geology, examining the non-metallic industrial minerals, their origins, minable locations, and use. The course went well and will be offered in the future as GeoE 405 Industrial Minerals. I again offered Geology of Mars as a spring course, but we still couldn't swing a field trip. I've worked closely with graduate student Tim Gerlach in his thesis investigating a buried impact crater beneath northwestern North Dakota. We're putting the finishing touches on that study now, readying it for publication. I've just returned from the field with graduate student Curtis Rockwell gathering samples of Knife River Flint for the fingerprinting study I've wanted to do for years. Curt is doing a portion of that study for his thesis. I'm also still involved with NDGS workers Ed Murphy (BS '79, MS '83) and John Hoganson (PhD '85) on our investigation of the Cretaceous Tertiary contact in south-central North Dakota. Outcrops there are the easternmost exposures of the contact in North America. Together with Doug Nichols of the USGS, we've determined that the temporal boundary, as indicated by palynomorphs, is quite close to the lithostratigraphic boundary workers in the area have been using for years.

I know some of you are already aware that I've given myself a permanent limp as a result of a skydiving accident. And it appears that my running days are over, as may be fieldwork in the badlands-- we'll see. Anyway, I certainly don't wish to scare anyone away from skydiving-- if you've ever had a desire to try it, definitely do! Just be sure to take your brain along on each jump.

PHIL GERLA: I have been busy this past year directing several theses, teaching hydrogeology courses, and serving on departmental committees. I co-authored (with Barb Sahl, Jon Folkedahl, and Gale Mayer) three UND Geology/Geological Engineering presentations at the Fourth Biennial North Dakota Water Quality Conference in April. I also have become involved with the budding "earth system science" program in CAS, where I am exploring the relationship of eutrophication to climate and hydrology in the prairie pothole region.

Late in the summer I traveled extensively, with a visit to Barrick Goldstrike Mines in Elko, Nevada to explore some potential research opportunities and later attending my parent's 50th wedding anniversary near Portland, Oregon. Soon after returning to Grand Forks, I led a departmental field trip to Yellowstone Park and vicinity (see article by Kyle Johnson).
Janet and I, and the kids, moved to a farmstead north of Climax, Minnesota, in April. I now mow a large lawn and fight the weeds in a 1/4 acre garden.

**WILL GOSNOLD:** The one certain thing about change is that it happens! For my students and I, change and progress are going hand-in-hand with a quantum jump in computer-oriented research and in computing power. Two shining examples of research activity are the recently completed Master's theses of **Mark McDonald** and Sameer Padhye. Mark received his M.S. in Geology this summer for his work in a complex task of interpreting a large amount of gravity data that was collected in a joint project with the USGS and the University of Texas at Dallas during 1991. The task of reducing the raw data to a useful form would have taken years without a good computer, good software and a talented, dedicated worker like Mark. Mark not only became proficient in analysis of gravity data, he mastered a lot of data analysis and visualization software in the process. His talents landed him a job immediately. Sameer Padhye received his M.S. in Computer Science this summer also. His research project involved computer modelling of the thermal regime of an underground coal gasification site using the UNO Cray and scientific visualization techniques. He is now at Ohio State where he is working toward a Ph.D. in computer science.
Computing power and our capabilities in scientific visualization increased enormously with the receipt of an equipment grant from NSF submitted with Grady Blount and Chuck Wood (Space Studies) and Jack Hammen (Geography). The grant for "An Imaging Laboratory Curriculum in Earth and Planetary Science" provided a Silicon Graphics Personal Iris to each of us. Our plan is to develop new course material that takes advantage of current methods in scientific visualization. This is where Sameer made a huge impact. He developed the schemes for displaying the output from the UND Cray on the SGI. He also set the SGI up to run Mosaic, an information browser on Internet that was developed by the National Center for Supercomputer Applications. "We are driving a Ferrari on the Information Super Highway!"

Summer research activities on climate change in the mid-continent will not be completed until about mid-October. The main summer tasks were core-drilling three heat flow holes: one north of Dallas, TX, one at Wall, SD, and one near Wawanesa, MB, and installing automated weather stations at each site. The third hole was finally completed at Wall, SD on August 29, the day before classes began, and it should be thermally stable by about mid-October. Two new Ph.D. students Paul Abell (M.S. Space Studies - UND) and Bill Schmidt (M.S. Physics - UND) are research assistants on the project and will make the initial temperature measurements. Data from the Wawanesa site has proved to be especially interesting. The ground-surface temperature has increased by more than 6°C during the past century! We now need to determine if the increase is the result of general air temperature increase, a trend in snow cover, or something else. The results are exciting!

Heat flow instrumentation, Nesbitt, Manitoba
(one of many typical field hazards)
JOSEPH HARTMAN: This fall, I am teaching invertebrate paleontology as an adjunct faculty member in the Department, along with my regular research at EERC. Major research projects concern the Cretaceous-Tertiary boundary stratigraphy and paleontology in Makoshika State Park, near Glendive, Montana. This project is cofunded by the National Geographic Society and the U.S. Department of Energy, in collaboration with David Krause of the State University of New York at Stony Brook. Field and laboratory studies have included Wes Peck (MS '92) (EERC) and soon-to-be-alumnus Tim Kroeger (abd). Steven Lund (BS '72) of the University of Southern California is participating in his study of the paleomagnetic stratigraphy through this interval. As a consequence of this year's activities, important new mollusk, mammal and palynomorph-bearing localities were discovered and documented.

Research continues feverishly on all things Malagasy. After field work in Madagascar last summer (funded by NSF, with Dave Krause and Neil Wells of Ohio State University), I presented talks on the paleontology and stratigraphy of this potent island to the members of Sigma Gamma Epsilon ("Madagaskara A Gondwana Eden"), as well as at Minot State University (MSU) and at EERC. A recent issue of Nature announced the discovery of the first mammal (75 m.a.) older than 8000 years. Stratigraphic and paleontologic efforts, to date, will be presented at the Seattle GSA meeting. A manuscript has been completed on the vertebrate research, along with pending proposals to NSF and the Dinosaur Society.

Other efforts have included collaborative studies with Allen Kihm (MSU) and Dave Krause on the Red Spring mammal locality, near Riverdale, the results of which were announced last fall at the annual meeting of the Society of Vertebrate Paleontology. Other activities with Allen Kihm have resulted in the relocation of "bird tracks" reported in Rodney Perkins (MS '87) Master's thesis in Billings County, as well as a new mammal locality nearby. Late last fall, I was invited to present a paper on the nonmarine molluscan paleontology of Colorado at the Denver Museum of Natural History. On a subject somewhat closer to home, I will
be presenting a paper at GSA on the biochronologic interpretation of the stratotype of the Fort Union Group (Paleocene), near the Missouri-Yellowstone River confluence.

Stop by and see my new facilities at EERC!

FRANK KARNER: In this past year I've enjoyed opportunities to work both in several new and several old directions. In teaching, I'm still faced with the challenge of teaching petrology without a preparatory course in optical mineralogy (dropped years ago because of demands of changing curricula). Right now I'm trying to return to basic chemical and physical descriptions that apply to all geologic materials, eliminate geology jargon wherever possible, and emphasize the practical use of earth materials. Your comments and suggestions are welcome! Geology 101 is exciting but sometimes tense as I try to get the somewhat unimpressed generation of the 90's to recognize the importance of geology in our lives and to take on an investigative geoscience project for first-hand experience.

In research, a partly old and partly new direction is an initial project (right now involving an excellent undergraduate major, Sherry Samson) on physical and chemical properties of soils, specifically the geological side of the role of clays and other minerals in soils. Sherry and I are working with other faculty in GGE and Chemistry and with Ray Butler, Dean Goebel, and Gale Mayer at EERC on this project which involves saline Red River Valley soils. Ron Matheney and I, with an interdisciplinary group of other scientists and engineers including Phil Gerla and Joel Kuszmaul in GGE submitted a major NSF proposal for a Water Quality Laboratory (WQL) for the third floor of Leonard Hall. Sherry's research project is the first using that lab space. Recent NSF funding of equipment for a WQL will allow many more student projects but we'll need moderate support for their lab expenses.
Meanwhile, working on the Leonard Award, departmental recruiting, advising and curricula as well as co-chairing the UND Curriculum Committee supersaturate me in university activities. Personally, I still play handball regularly, spend a little time with Joan, and travel to visit our almost grown-up kids; and finally after about 18 years, I'm finished as a hockey parent, with Jim moving on from Bemidji State's NCAA DI national championship team to graduate school in geology at the University of New Mexico.

PATRICIA KELLEY: With the assistance of GRA's Vicky Andrews and Rob Sickler, I have continued my research on predator-prey relationships in the fossil record. Our results, coauthored with Thor Hansen (Western Washington University), were presented this past year at GSA in Boston, AAAS in San Francisco, and the North Dakota Academy of Science. Thor and I have just received a three-year renewal of our NSF-supported project ("Collaborative Research: Escalation and the Role of Mass Extinction in the Cenozoic Evolution of the Naticid Gastropod Predator-Prey System"). The grant supported field work this summer in the Miocene of Maryland; we shipped back 899 pounds of fossils to occupy our graduate students next year.

My service activities this past year included another NSF panel (NSF Young Investigators), technical editor for the Journal of Paleontology, and offices in professional societies (Vice-Chair, North-Central Section of the Paleontological Society; Nominating Committee, Geology & Geography Section of the American Association for the Advancement of Science; Executive Committee, North Dakota Academy of Science). I have also been chosen a Paleontological Society Distinguished Lecturer for 1994-1995.

SCOTT KOROM: Before coming to UND I spent two years at the Savannah River Site as a postdoctoral research fellow with the Oak Ridge Institute for Science and Education, which is part of the Department of Energy. The Savannah River Site is a large (over 300 square mile) DOE facility in South Carolina. My research involved the adsorption of bromide onto sediments at the site. As an anion, bromide is typically assumed to be conservative in sediments and is now one of the most commonly used groundwater tracers. At the Savannah River Site, however, bromide is adsorbed onto many of the sediments underlying the area and is not conservative. Using soil columns I measured this adsorption onto Dry Branch sediments as a function of bromide concentration. I hope to use these data in numerical experiments to determine how the anionic adsorption exhibited at the site may affect the subsurface transport of a bromide plume.

JOEL KUSZMAUL: In my first full year at UND, I have chaired the Geological Engineering Curriculum Committee and helped to coordinate the preparation for the upcoming ABET accreditation review of the geological engineering program. During the summer, I traveled to Austin, Texas, to attend and present a paper at the First North American Rock Mechanics Symposium. JoEllen now commutes each week to Minneapolis so that she can continue her career as a geological engineer. JoEllen has been the one doing all the driving so far, but I know that the time is coming when I will have to do my share of driving across Minnesota. We know that this arrangement will be the most difficult when unpredictable winter road conditions start to affect our schedules.

We took as much time as we could to enjoy the area during our first summer here. We made our first attempt at a garden and were reasonably successful (I'm told that we had nearly ideal gardening weather this summer). JoEllen and I both enjoy canoeing, so we took two trips to the Boundary Waters Canoe Area Wilderness (BWCAW) in Minnesota. We battled the bugs, the wind, and some nasty
thundershowers while we enjoyed every minute of our time in the BWCAW. For our next adventure, we will have to try kayaking in Lake Superior.

RICH LEEVER: My research continues along several fronts these days; Jerry McCloskey and I are working on the Cretaceous system in North Dakota, and Jon Ellingson and I are studying the Winnipeg Group. In addition, Julie and I are still investigating the relationship of salt stratigraphy to hydrocarbon resources in the Williston Basin. Tom Heck (MS '79) is collaborating with me on the statistical prediction of resource assessment. It is a good variety of interesting topics. In addition to all this and my course load, advisement, etc. I spent considerable time revising the Department Policy Statement this summer (long overdue!)

Kathryn is now 11 yrs old and Christine is already 6 yrs old! They keep Julie and me busy and entertained!

RON MATHENEY: I have continued to serve on many graduate committees and to teach a full load of undergraduate and graduate classes (including geochemistry, hydrogeochemistry, isotope geochemistry and historical geology) while working with graduate student John Parry on National Science Foundation-funded research that is exploring whether the oxygen-isotope compositions of sedimented diatom frustules can serve as proxy paleoclimate indicators. We are now culturing the siliceous algae in growth chambers in the Biology Department and analyzing the waters using some of the vacuum-line and mass-spectrometer facilities I developed for the GGE Stable Isotope Geochemistry Lab. In addition, I have worked with Phil Gerla on wetlands research, and we recently coauthored two papers and a talk to be given at the GSA meeting in Seattle this fall. I have also turned considerable attention to the problem of providing adequate analytical facilities for our many students in environmental science and engineering, joining with Frank Karner, Phil Gerla, Joel Kuszmaul and faculty from other science and engineering departments to submit a request to the National Science Foundation to provide funds to build a Water Quality Laboratory. Coincidentally, as I was preparing this note for the newsletter, word came from the NSF that the Water Quality Lab proposal was funded for almost $192,000.00! In addition, UND will provide substantial matching and cost-sharing funds. Still, much work remains to be done and we are delighted that Scott Korom has joined our efforts.

My wife, Karen Katrinak, has been at the Energy and Environmental Research Center for almost three years, and is now manager of its Natural Materials Analytical Research Laboratory. We bought a house in Grand Forks in July.

DEXTER PERKINS: During the past five years, I have become more concerned about undergraduate education, and less involved in research. This year, for the third year in a row, I will be teaching an undergraduate honors course. It is called "The Diversity of Species" and is based on Edmund Wilson's excellent book of the same title. Colin Hughes (Biology Dept.) is a co-instructor. The course examines the nature and causes of biodiversity, the importance of biodiversity, and the unprecedented loss of species that is occurring at the present time. I am also teaching another interdisciplinary course: "Religion and Energy Use." Scott Lowe (Religion Dept.) and I chose this rather strange title in order to attract attention. It seems to have worked.

Perhaps the biggest thing I am working on now is a new text book for Mineralogy. I signed a contract with Macmillan and have already written nine chapters. The book will present mineralogy in a different order than is traditionally done. It
starts with the big picture (rocks) and ends with the small (atoms). Abstract concepts, such as crystallography, are only introduced after the concrete material has been covered. The occurrences and importance of minerals are played up. Basically, my revised curriculum presents mineralogy in the order in which it was discovered.

This summer my free time was divided between writing and soccer. Both of my kids are avid soccer players, and I coached for Doug's team. We took a family trip to see the World Cup games in Detroit. This fall will involve the same activities, in addition to teaching. Instead of coaching soccer, however, I am refereeing. It keeps me in shape chasing those high school players up and down the field.

Late in the summer the family went rock climbing in the Wind Rivers. We backpacked into Lonesome Lake and climbed in the Cirque of Towers for six days. It was fun to climb some spectacular and classic routes with my kids. We managed to do one big wall: the north face of Mt. Mitchell. What made the trip into the Winds especially fun for me was that many of the routes we climbed were the same ones I did over 25 years ago. What made the trip especially fun for the kids was that there was a really aggressive black bear that systematically destroyed people's tents. Fortunately he left our's alone; we were smart enough to make sure that all of our food was hanging on a cliff ¼ mile from the campsite.

After the Winds, we went to the Tetons where George and I climbed the North Ridge of the Grand. It was a tough climb, involving ice axe and crampons, and one very cold bivouac. I was impressed with George's confidence and ability. The rangers said he was by far the youngest kid to ever climb the route.

Betsy continues to run the Grand Forks Food Coop, which has changed its name to Amazing Grains. She has been managing the business for two years. This year, for the first time in several years, they are making money.

**JOHN REID:** This past year has been one of continual change... busy, but rewarding. Working with Eric Brevik on his thesis on maximum ice thickness in the Grand Forks area was something I have wanted to do for a long time. He and I presented the results at the ND Academy of Science in April. I also supervised (with Ray Butler [BS GE '70, MS '73, PhD '80]) a dye-penetrant study by Cal Taylor in the Anamoose and Thompson areas of ND. Both theses are significant contributions and plans are underway to have the results published. In addition, I supervised a number of Senior Theses and seminar-topic studies. All took much time, but the results were rewarding (especially to the students). My own research has been limited to interpreting the geomorphology of an archaeological site near Hillsboro, ND (Halstad, MN). The excellent cores have provided an opportunity for two undergraduate seniors to learn analysis techniques and writing skills.

I have been fortunate to be invited to instruct workshops each year for the Corps of Engineers. This year it was in Denton, TX. It is always a good opportunity to share my experiences with a variety of people in different parts of the country.

On the personal side, a little over one year after my mother died of cancer, my dad had a serious heart attack. He is now living with Barbara and me, but doing well, despite his heart damage and his Alzheimer's disease. He wanted to be around family and we have the greatest number. It is tough to grow old!
SUNDAR SALUJA: I am glad to report that phased retirement has helped me to move towards spending more time and effort in earning (through service without financial rewards) some traveller checks for the unchartered journey, which may commence any time, without any formal notice.

This past year I was honored by the Distinguished Alum Award from Khalsa College, Amritsar, India. While there, I delivered a lecture on "Peace of Mind through the Reclamation of Our Spiritual Environment" at the Teachers' Training College, Guru nanak Dev University. I was also appointed member of the State Advisory Committee of the US Commission on Civil Rights, and received a grant of $8000 from the Amax Foundation.

I organized several programs under the Great Plains Forum and the Foundation for the Reclamation of Our Spiritual Environment and was invited to make several presentations related to my increased interest in spirituality and how it affects our lifestyles, e.g., "Successful and Joyous Living through the Reclamation of Our Spiritual Environment," "Two Challenging Projects for the Sikh panth for the Tricentenary Celebrations in 1999," "Successful Entrepreneurship through the Reclamation of Our Spiritual Environment," and two lectures on the "Efficacy of Spiritual Growth towards a Happy and Successful Life."

I also attended UU Midwest Leadership School held at Beloit, Wisconsin, in July. The school provided me an opportunity to learn a lot about other traditions and a forum for close interaction with people from several states; the experience will assist me in the proposed writings.

On the home front, Urvasi, our daughter, a practicing surgeon in Delhi, India, had a great opportunity when she was chosen to treat Mother Teresa, who became unwell while visiting her mission in Delhi. Ravita, our daughter-in-law, an Internist with Keisers HMOs, Milpitas, California, received the award for being evaluated as the best physician in her discipline.
Dipender, who started his engineering education at UND (1982-84), received two promotions in one year; was promoted to Technical Manager, Application Services in April and to the newly created position of Business Manager, Worldwide Application Services at Cadence Design Systems Inc., San Jose, California.

YELLOWSTONE FIELD TRIP 1994

As part of society's increasing consciousness of its place in the natural world, it is critical that we, as future geologists, achieve a higher level of understanding of the processes that shape the face of our world. The field trip to Yellowstone National Park and the surrounding area was an opportunity for our group to experience a unique and mighty example of a changing earth. Due to the geographical location of the University of North Dakota, we have learned to relish the opportunity to experience this type of field geology.

Yellowstone Fall Field Trip. (Phil Gerla in center)

The basic tools of geology are still the hammer, a stout pair of boots, a notebook and a keen power of observation. The tool of observation is unquestionably the most important of the four. This trip was designed to improve our observational skills by studying the complex geology and geological formations of the Yellowstone region.

The trip itinerary was organized by Phil Gerla. Funding for the cost of the van, camping fees, and one night of lodging was provided mostly by UND's Office of Instructional Development and supplemented with Department of Geology and Geological Engineering alumni contributions.
On August 21 the odyssey began. One day later, after 770 miles, we arrived at the abandoned Benbow chromium mine in the Stillwater Mafic Complex northwest of Red Lodge, Montana. At the mine, we were able to collect fine mineral specimens. The drive to the mine was ominous, intense, and white knuckled; nothing short of a mountain-goat style 12 miles. The group adopted a positive attitude which was tested every time a formidable obstacle was encountered on the road. Murmurs of "Oh, No Problem" were heard quite often that day.

The next three days of the trip were within Yellowstone National Park. After Mammoth Hot Springs, we visited the thermal features near Lemonade Creek and the Amphitheater, an undeveloped area of gas vents, mud pots, and hot springs. After a swimming stop at Firehole River and an overnight stay at Grant Village, we examined a volcanic vent, dikes, and normal faults near the eastern margin of the Yellowstone Caldera.

On Friday, August 26, we had the opportunity to tour a proposed gold mine, thanks to the Crown Butte Mining Co. of Cooke City, Montana. Later that afternoon, the seven of us began the anticipated three-day backpack adventure to Goose Lake (in the Absaroka-Beartooth Mountains, Custer National Forest) which turned out to be the highlight of the trip. During the hike through the mountains, we viewed numerous mine prospects, sulfide deposits, large magmatic intrusions, and all the Precambrian gneiss one could possibly fathom. The next day was spent hiking to and from Grasshopper Glacier. This day was doubly special because we encountered both a small herd of mountain goats and a panoramic view of some of the most craggy, harsh, jagged, and mysterious terrain in the Rocky Mountains. As we explored the "glacier" and the glacial cirque, one couldn't resist gazing at the pastel blue-green colors of the high country lakes. The backpack trip reached a wonderful close by eating a fresh cutthroat trout dinner from Goose Lake.

On Sunday August 28, before the drive back to North Dakota, we climbed (not walked) a precipitous cliff south of Silver Gate, Montana, to take a look at the world famous Heart Mt. detachment fault. [WARNING: Anyone interested in studying this detachment fault is strongly advised to have some kind of mountaineering experience.]

The drive back was a time of silence because of the traumatic thought of returning to Grand Forks, but our wives and boyfriends needed us! It was time to come home. Due to the success and educational value of the Yellowstone field trip, we're all emphatically anticipating a repeat performance at some other fabulous area of the globe next summer. We express our deep gratitude to you alumni for your part in our education!

- Kyle R. Johnson
The Geology Advisory Committee was established in 1981 by Department Chairman Lee Gerhard, primarily as a vehicle to raise outside funding for the department. The committee was very active in the early 1980's and was successful in establishing a fieldtrip fund for the department. In 1983, a Geological Engineering Advisory Council was established by Department Chairman Don Halvorson to offer guidance and advice to the Geological Engineering Program. The Geological Engineering Advisory Council scheduled meetings in the fall in Minneapolis and at UND in the spring during Engineering Week. During the 1980's, Bruno Hanson was chairman of the Geology Advisory Committee and John Klemer was chairman of the Geological Engineering Advisory Council.

In 1990, Department Chairman Frank Karner combined the two alumni committees into the Alumni Advisory Committee for the Department of Geology and Geological Engineering. Frank believed that this combination would benefit both programs. The initial chair of the newly formed committee was Bryan Johnsrud. In late 1990, Kurt Hillman and Ed Murphy became co-chairman and established several subcommittees to focus on such departmental topics as outside funding, equipment needs, and summer intern jobs for students. Unfortunately, these subcommittees never got going because the committee spent a majority of its time lobbying to save the Geological Engineering Program and to fill vacant faculty positions within the Department. Advice from the committee was to emphasize teaching as a priority over research and service in the department, pointing out that the strength of the department over the years has been its ability to offer a good, well-rounded education in geology and that it should resist the pressures to become over-specialized.

In 1992, Ed Murphy chaired the Alumni Advisory Committee and most of that year was spent on formulation of the Leonard Medal and the Department reunion at homecoming honoring Wilson M. Laird. In 1993, Milt Lindvig and Marv Rygh became co-chairmen of the committee and immediately began reestablishing the subcommittees with the intention of addressing the topics that the committee had originally proposed in 1989. However, the focus of the committee abruptly changed when a directive from the UND Vice President of Academic Affairs in the fall of 1993 outlined reorganizational change in the University. Several of these changes would have adversely affected the Department, including eliminating both the PhD program and the Geological Engineering program, along with combining the Geology Department with Geography into an Earth Science Department within the College of Arts and Sciences. There was also a proposal to relocate the geology library in the Medical Sciences building, combining it with all the other science and engineering libraries. The possibility that the Geology Department would be moved out of Leonard Hall was also a concern. The committee spent considerable time on these issues and provided a position paper to the Vice President of Academic Affairs. Thanks to all the alumni who supported the committee's actions and also to those who took the time to respond to this matter individually.

In the upcoming year, the Alumni Advisory Committee hopes to try once again to get going on establishing the subcommittees and focus on what the alumni can do to support the Department. The committee will be looking into what it can do to initiate support for the newly funded Water Quality Laboratory in the Department. A review of curriculum will also be a topic for consideration.
Alumni Advisory Council (left front, clockwise): Sundar Saluja, Marv Rygh, Rod Feldmann, Phil Gerla, Kelly Carlson, Sid Anderson, Ed Murphy, Bob Johnson, Frank Karner, Tricia Kelley

Alumni Advisory Committee Members

**Equipment:**
- Palmer Bailey
- Frank Beaver
- Ken Larsen
- Mary Rygh

**Financial Support:**
- Mark Erickson
- Wally Popejoy
- Rod Feldmann
- John Utgaard
- Tom Hamilton
- Fred Wosick
- Bob Johnson

**Job Opportunities:**
- Jim Berg
- Bret Fossum
- Bruno Hanson
- Mark Millsop
- Camie Pederson

**Leonard Medal:**
- Sid Anderson
- Milt Lindvig
- Ed Murphy
- Bud Holland
- (Frank Karner, John Reid, Patricia)
- Kelley as departmental members

If you would like to become a member of the Alumni Advisory Committee, please contact a member of the committee or the Department. We encourage all alumni to stay in contact with the Department and take an active role as possible.

- Milt Lindvig (BSGE ’61)
- Ed Murphy (BS ’79, MS ’83)
- Marv Rygh (BSGE ’82, MS ’90)
A CHAT WITH THE NEWEST GEOLOGICAL ENGINEERS

I asked Scott Korom and Joel Kuszmaul, the co-chairmen of the Geological Engineering Curriculum Committee, to share some thoughts about that program, especially in light of the proposal by the new Provost last year that the program should be reconsidered and probably terminated (the proposal was subsequently withdrawn, pending review by the ABET Accreditation Team).

Scott, What were your first impressions of the Department? My first impressions were favorable. Leonard Hall was clean and well organized; bulletin boards were current and displays were neat and interesting -- I'd love to show my niece and nephew the Triceratops skull in the lobby. More importantly, I was impressed with the faculty members; they had strong educational backgrounds, an established commitment to teaching, and a growing research track record. I found them to be sincere and friendly. They were particularly frank about the challenges facing a new faculty member at UND, pesky mosquitoes, unimaginable winter temperatures, and tight budgets.

What expectations do you have for the Geological Engineering Program? I expect to see Geological Engineering's accreditation continued as a result of the ABET visit this December. I also would like to see student enrollments increase as we continue to develop coursework and research projects that relate environmental issues with hydrogeology and groundwater engineering. An example of new coursework is Groundwater Monitoring and Remediation, which we hope to introduce this spring. In it we plan to discuss such topics as groundwater sampling methodologies, statistical methods for groundwater monitoring, in-situ bioremediation, pump and treat strategies, and bioventing.

What are your goals? Being in a tenure-track position I need to make contributions in the areas of teaching and research. I mentioned a little of my vision for teaching above. With respect to research, I would like to see our department, in possible collaboration with the Department of Civil Engineering and the EERC, develop nationally recognized programs. Two research areas for which North Dakota is well suited are wetlands and the minimization of agricultural groundwater contamination. In addition we are seeking to work collaboratively with the Savannah River Technology Center on groundwater remediation projects. The SRTC is part of the Department of Energy's Savannah River Site in South Carolina. Finally, somewhere in the hectic schedule that I'm discovering is a professor's destiny, I want to take advantage of the many outdoor activities North Dakota has to offer.

Joel, What do you consider to be the strengths of the GE program? With the addition of Scott Korom to our program, we have established an outstanding teaching and research strength in geoenvironmental issues. Scott's strengths complement the background of a number of faculty members in our department as well as the Civil Engineering Department. A strong geoenvironmental program will certainly be helpful to our Geological Engineering students, but it will also help our Geology, Environmental Geology and Technology students, and graduate students too. Of course, this departmental strength coordinates well with the mission of the Energy and Environmental Research Center (EERC). We hope this will lead to collaborative research projects in the future.

What are our chances in the ABET review? We are looking forward to the visit of the program reviewers from the Accreditation Board for Engineering and Technology, Inc. this December. Much has changed since their last visit; we have
a new Geological Engineering curriculum, we have new committees providing
direction (the Geological Engineering Curriculum Committee and the Department's
Alumni Advisory Council), and two new Geological Engineering faculty members.
Each faculty member has moved to improve the design experiences of our students.
We certainly have spent a great deal of effort on these improvements, and I am
confident that we have succeeded in establishing an accreditable program.

The Restructuring and Reallocation discussions that took place on campus last
year certainly did not help the program. When Vice-President Strathe recommended
the elimination of our program, we were diverted from our tasks of teaching and
developing the quality of our program. More significantly, all of the students
who transferred into Geological Engineering last year have left the program, and
the number of new Geological Engineering students entering this year is down from
previous years. We will have to actively recruit students for the program. One
of the most helpful things that we could do is to restructure our curriculum so
that students could transfer into our program as sophomores and graduate within
their first four years. The School of Engineering and Mines is currently engaged
in an effort to address this issue in all UND engineering programs.

What other changes in the program do you hope to see in the future? One area of
the Geological Engineering Curriculum that I would like to see improved is the
laboratory and field experiences of our students. Two of the technical electives
that are currently offered are Soil Mechanics Laboratories and Hydrogeological
Field Methods. I would like to see both of them be required (or at least require
students to select one). In addition, I would like to see more of a laboratory
component to the Geomechanics course. Field work has been added to the course
this year, but the curriculum committee should consider whether Geomechanics
should also have a laboratory component as well. I believe that strong field and
laboratory skills will be essential to our graduates during their career.

Earlier, I mentioned that I believe that our geoenvironmental offerings are
now a strength of our department. That is good for the program today and for our
students seeking employment now. During their careers, however, our graduates
will most likely work in more than one industry. It will serve our students best
if we offer a broad education in geological engineering. Today, geoenvironmental
technical electives are popular. In a few years, other industries will be
demanding graduates with other strengths, and we will have to readjust the
courses that we offer to satisfy the needs of those students as well.

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LEEPS LECTURES 1993-94

The LEEPS (Leading Edge of Earth and Planetary Sciences) Lecture series is now
in its fourth year and has proved to be the most successful lecture series on the
UND campus. Begun through the efforts of Dexter Perkins as the FOG (Frontiers of
Geology) Lecture Series, it has now become more of a UND effort to bring to the
campus outstanding researchers. These scientists not only share their research
results in formal seminars, but also interact with faculty and students alike
(one-on-one and in small groups). We have long concluded that this is the most
efficient and effective way to expose our students to the exciting research
others are doing. In addition, the researchers often inspire faculty members and
students with new ideas for research. A bonus to all of this is the fact that
every lecturer leaves UND impressed with the high quality of the Department
(excellent advertising for future students).
The high quality of our speakers is reflected in their wide recognition. For example, Chris Maples, a speaker in 1992, is the 1994 recipient of the Schuchert Award of the Paleontological Society, and Thor Hansen, also a 1992 LEEPS speaker, has received the Paul J. Olscamp Award as the Outstanding Researcher at Western Washington University. In addition, three more recent lecturers were invited speakers at the biennial AMQUA meetings this summer: Bill Ruddiman, Julie Brigham-Grette, and Steve Porter. Our tentative list this year is designed to invite a cross-section of outstanding researchers.

Funding for the LEEPS Lecture Series is from a variety of sources, including the NSF-ASEND Program, the Office of Research and Program Development at UND, the Energy and Environmental Research Center (EERC), from the Geography Department, the Space Studies Department, and from you, our alumni. This year EERC has informed us that they will be unable to support the Series, leaving us short of adequate funding. But, with Will Gosnold in charge we will find enough to continue with a slightly reduced program. Your continued unrestricted donations to the Department can enable us to maintain the high quality of this very important Lecture Series.

This past academic year the following scientists shared their research endeavors with us:

Anne Raymond (Texas A&M): "Carboniferous continents, coal, and climate: How to choose a paleogeographic reconstruction" and "Looking for the Frasnian-Famennian mass extinction on land: phytogeography of the Late Devonian"

John Brady (Smith) (Mineralogical Society of America Lecturer): "Why Walden Pond is an imperfect model for a Lava Lake" and "Marble-hosted talc deposits in SW Montana: evidence for deep circulation of Proterozoic sea water"

Jim Grant (Minn-Duluth) "Contact metamorphism and partial melting of pelitic rocks in the aureole of the Laramie Anorthosite Complex" and "Isocon analysis of mass transfer: migmatisites, hydrothermal alteration, paleosols and groundwater"

Jim Stark (USGS-Minneapolis) "Stream-aquifer relations along the Straight River, Becker & Hubbard Counties, MN"

Bruce Jakosky (Colorado):"The exploration of Mars" and "History of the climate of Mars"

George Stanley (Montana) (Paleontological Society Distinguished Lecturer): "The evolution of reef ecosystems" and "Exotic terranes."

Robert F. Lindsay (Chevron U.S.A. Production Company) (Haas-Pratt Distinguished Lecturer for the American Assoc. of Petroleum Geologists): "Carbonate sequence stratigraphy on the development geology scale: outcrop and subsurface examples from the Permian Grayburg Formation, Permian Basin"

Cathy Manduca (Carleton College): "Cretaceous Tectonics in Western Idaho-A View from the Middle Crust" and " Hornblende and Epidote as Igneous Barometers"
Emi Ito (University of Minnesota): "A 400-year record of hydrologic balance in the northern Great Plains: a multi-proxy investigation of lacustrine sediment record" and "Calibrating the fractionation of O, C, isotopes and Mg/Ca, Sr/Ca ratios between benthic ostracodes and lake water"

Petr Cerny (Manitoba): "Mineralogy, geochemistry and economic geology of the Tanco pegmatite deposit, southeastern Manitoba" and "Distribution, affiliation and derivation of rare-element granitic pegmatites in the Canadian Shield"

Margaret Leinen (Rhode Island): "Defining the role of the ocean in climate change" and "Glacial to interglacial changes in atmospheric circulation: evidence from deep sea sediments"

Jim Sadd (Occidental College): "Oil spills and contingency planning: A geologist's view" and "Mugu lagoon coastal wetlands, central California: Geological history and human influences"

Class returning from Devils Heart Butte, south of Devils Lake
IN MEMORIAM

It is with sadness that we report the passing of several alumni.

Mary Jo Klosterman (BS '78) was one of at least 57 who died in the July 2 air crash near Charlotte, NC. Her early and sudden passing is a loss to a great number of family, friends, and co-workers. Mary Jo was fondly remembered by those of us who knew her as a student at UND, especially Bud Holland, who supervised her work on the N.D. REAP project to establish a data base on fossil localities in North Dakota. She wrote her Senior Thesis under Tim Cross, during which time she developed her interest in sediments, sedimentary rocks, and stratigraphy. Upon graduating Mary Jo attended Louisiana State University, completing her Master's degree in Geology. She joined Exxon in 1980, travelling extensively to Venezuela, Colombia, Trinidad, and Azerbaijan. She had just finished meeting with graduate students from the University of South Carolina, working under a fellowship program funded by Exxon, when her plane crashed in a storm.

Our sincere sympathy goes out to her parents and family in Fargo, and to her husband, Jim Glaser, and her two children in Houston.

Coleman Quill, a long-time student in the Department during the late 50's and early 60's, died 12 November 1993 in Bismarck.

We also regret to report the passing of several friends of the Department:

Mercedes (Babe) Kohanowski (87 yrs) passed away in Grand Forks on Jan. 12, 1994. As the wife of former faculty member, Nick (who died in 1986), Babe was the steady, practical, supportive partner, willing to accompany Nick to Bolivia, Libya, and even Russia. While at UND Babe taught Spanish for many years. Her lively spirit will be missed. Our sincere condolences have been expressed to her family, especially her sons, Frank (Wisconsin) and Nick (Moorhead, MN).

Richard Cameron served loyally as a technician for the NDGS for many years. Many of us fondly recall his casual approach to all crises. Whatever they were, he would take care of them. Dickie could always be counted on for a great variety of tasks, including setting up UND's field camp (subsequently named Camp Cameron) in the Badlands near Medora. The first camp at the edge of the Martin River Glacier, Alaska, also was named for him in 1962. Dickie passed away Feb. 28, 1994, at the age of 88 years. Our sympathy is extended to his wife, Pearl, and their children and grandchildren.

George Starcher (88 yrs), President of UND for 17 years, died 8 June 1994 at his home in Sarasota, FL. President Starcher was a strong supporter of the sciences; the Geology Department expanded significantly under his presidency.
1994 EERC Report

U.S. Energy Secretary Hazel O'Leary spoke during a ceremony Aug. 26 to dedicate the new Environmental Research Laboratory and Pilot Plant additions at the University of North Dakota's Energy & Environmental Research Center (EERC). O'Leary, a former vice president with Northern States Power Co. in Minneapolis, was appointed Energy Secretary by President Clinton in 1993.

Construction on the expansion project began in 1992 and was completed early this year. The EERC's growing environmental research and development programs required a significant expansion of laboratory facilities. The new additions have enabled the Center to consolidate labs that were located across the UND, including Leonard Hall, campus and provide office space for the researchers and technicians who work in the labs.

Funding for the $7.6 million project was provided from the following sources: $3.5 million from a U.S. Department of Energy grant, $2.5 million from a state bond issue guaranteed by the UND Alumni Association Foundation (to be paid back by the EERC over a 10-year period) and a $1 million grant from the Grand Forks Growth Fund. The EERC provided $600,000 in funding from its revenues.

The expansion project was completed in two phases. The first phase was the four-level, 50,000-square-foot Environmental Research Laboratory Addition connected to the north side of the administrative building. The laboratories housed in this new facility include inorganic analysis, process chemistry, high-temperature materials, geoscience, gas chromatography, mass spectrometry, process chemistry, paleontology, analytical research, and biotechnology.

The second phase was a three-level, 7,400-square-foot Pilot Plant Addition immediately southeast of the administrative building. This addition provides increased space for the installation of new test equipment, a staging area in which equipment can be built, and room for equipment storage. In addition, it includes improved and expanded facilities for the EERC's pilot plant operations staff.

Other major projects being conducted at the EERC include:

National Center for Excellence on Air Toxic Metals
The Center has been designated as a National Center for Excellence on Air Toxic Metals by the U.S. Environmental Protection Agency. This enables the EERC to work closely with industry to develop consortium-sponsored projects aimed at reducing and preventing air pollution from power plants and waste incinerators. EERC research focuses on technologies for existing energy generation facilities, as well as designing the next generation of equipment to control toxic metal emissions from utilities, incinerators, refineries, and other industrial sources.

Biennial energy and environment conference in Prague, Czech Republic
"Energy and Environment: Transitions in East Central Europe" was first held in April 1992 and was attended by 300 people from 26 nations. A second conference is set for November 1994. The conferences create partnership opportunities between government, industry, and research organizations to help solve energy and environmental problems in East Central Europe.
Hot gas cleanup project, Electric Power Research Institute
An international consortium formed by EPRI is working with the EERC to study ash problems associated with the cleaning of hot gases in advanced energy systems. The project is funded by EPRI, the U.S. Department of Energy (DOE) and nine energy-related businesses in Germany, the Netherlands, France, the United Kingdom and the United States.

Sour gas plant remediation, Canadian Association of Petroleum Producers
The EERC is working with the Canadian oil and gas industry to identify the most effective and economical ways to clean up subsurface contamination at plants processing high-sulfur natural gas (sour gas). Sour gas-producing plants are found worldwide, and there are a large number in Alberta where they cause varying levels and types of subsurface contamination.

Gas industry groundwater research program, Gas Research Institute
The EERC is working with the Gas Research Institute (GRI) to determine whether mercury contamination at natural gas industry sites is moving into groundwater and to evaluate technologies for cleaning up the contamination. The research focuses on understanding how mercury behaves under a wide range of conditions at gas industry facilities in Louisiana, New Mexico and Pennsylvania.

Waste-to-energy technology, EnerTech Environmental
The EERC is developing this process with EnerTech Environmental, Inc., Atlanta, Ga., and the DOE’s Morgantown Energy Technology Center. The EnerTech process separates recyclable materials such as glass, aluminum and iron from municipal waste and then converts the waste to a clean-burning liquid fuel.

Plastics recycling, American Plastics Council
This research project on advanced technology to recycle plastics is being conducted by the EERC for the American Plastics Council, a consortium of 25 major U.S. plastics manufacturers. The EERC’s process converts post-consumer plastics into liquids that can be used by plastic production facilities and refineries.

Effects of agricultural chemicals on groundwater, U.S. Department of Agriculture
The Center is conducting regional groundwater research on the impacts of agricultural chemicals on groundwater in the northern Great Plains as part of an eight-year program supported by the U.S. Department of Agriculture. The overall objective is to provide scientifically valid data needed to develop the best management strategies for various agricultural practices under different climatic, geologic, and hydrogeologic conditions. The research focuses on developing information to understand the occurrence, transport, and fate of agricultural chemicals in representative settings in the northern plains.

EERC Geology Alumni Report

Frank Beaver (BSGE ’84, MS ’84, PhD ’86), EERC associate director, is actively involved in ongoing research projects at the Center that include research on groundwater and mercury contamination for the gas industry; geochemical aspects of wastes from advanced coal systems; waste utilization opportunities; mine land reclamation; and the impact of agricultural chemicals on groundwater. Projects under development include: a wetlands research program; commercialization of environmental remediation technology; direct coal liquefaction; and underground coal gasification in the southwest Pacific.
David Brekke (MA ’79), research associate, conducts mineralogy microprobe research using the Center’s scanning electron microscopes. Projects on which he is working include mineral transformations in gasification systems and studies of buried fly ash and metal-contaminated sediments.

Ray Butler (BSGE ’70, MS ’73, PhD ’80), is a senior research advisor of groundwater, waste management, and mining reclamation studies at the EERC. His principal areas of research include geologic and hydrogeologic studies of aquifer systems and water resources, studies of groundwater in mine settings, impacts of agricultural chemicals on groundwater, and contaminant characterization and remediation design for various industry wastes, contaminants, and disposal settings.

Dan Daly (MS ’84), research manager for resources and strategic planning, is currently coauthoring reports dealing with the occurrence, distribution, and management of gas industry-related drilling wastes and produced water under the EERC’s Gas Industry Groundwater Research Program. The results of this work were presented at the Rocky Mountain Symposium on Environmental Issues in Oil and Gas Operations in Denver in July. Other activities include the coauthoring of a profile of energy and environmental issues for East Central Europe. He also serves as editor of the Low-Rank Coal Newsletter.

Kurt Eylands (BA ’81, MA ’89), EERC research associate, is actively involved in ongoing research projects primarily in the utilization of coal combustion by-products. These projects include using fly ash for the solidification and stabilization of wastes, road building materials, controlled low-strength materials, and ceramics. Other areas of research he is involved in include phase transformations of minerals and the development of analytical methods, primarily with Scanning Electron Microscope/Microprobe.

John Foster (BS ’86), is a research geologist and field engineer at the EERC. As part of the Center’s groundwater team, he has been involved in hydrogeologic field testing of solid residues from advanced coal combustion processes, abandoned mine land research, and research on the environmental impacts of agricultural chemicals. He specializes in vadose zone monitoring and microprocessor-based remote site monitoring.

Dean Goebel (BS ’86, MS ’92), a research scientist and hydrogeologist, has been doing ongoing field work (including the addition of two new field sites) under a U.S. Department of Agriculture project studying the effects of agricultural chemicals on groundwater. He is managing a project involving an environmental assessment of the scope and magnitude of potential problems associated with a landfill in northeastern North Dakota. He is also involved in a wetlands research program that is currently under development.

Gerry Groenewold (MS ’71, PhD ’72), EERC director, is responsible for planning, staffing, and technical direction of a multidisciplinary research and support staff of approximately 260, emphasizing all aspects of coal-related research (resource evaluation, extraction, combustion, conversion, and environmental issues) as well as research focused on groundwater, waste disposal/waste utilization, oil, gas, ethanol, and related energy and environmental issues. He continues his efforts to broaden the Center’s international scope and to commercialize effective energy and environmental technologies by working with industry and venture capital groups. He was recently appointed to the Greater North Dakota Association’s Vision 2000 Committee. He reports that his latest
antique car restoration project is a 1908 Kissel.

John Harju (BS ’86), research manager and geologist at the EERC, coauthored a paper to be published in a special issue of the Journal of Water, air, and Soil Pollution entitled "Field-Based Research on Elemental Mercury Spills." He also will present an invited paper at the 1994 annual meeting of the Society of Environmental Toxicology and Chemistry (SETAC) entitled "Occurrence, Transport, and Fate of Mercury in Shallow Groundwater Systems." John’s field-based research continues in New Mexico, Pennsylvania, and Louisiana, and will soon expand to Alberta, Canada.

Joseph Hartman (adjunct faculty), is presently teaching invertebrate paleontology in the Department of Geology and Geological Engineering at the University of North Dakota. Recent research has focused on the paleontology and stratigraphy of the greater Glendive area, along the Cedar Creek Anticline in Montana. In North Dakota, studies have included the type area of the Fort Union Group, the Riverdale area, and in the breaks of the Little Missouri River north of Medora. Studies have continued on the Upper Cretaceous paleontology and stratigraphy of the Mahajanga Basin in northwestern Madagascar, which has resulted in presentations, papers, and submitted proposals (to go back).

Kevin Henke (MS ’84, PhD cand.), is a research geologist at the EERC and is involved in research dealing with groundwater contamination issues and the mineralogy, chemistry, and leachability of solid wastes. He continues to be heavily involved in the Center’s mercury contamination program with the Gas Research Institute. In the past year, he has coauthored several publications related to mercury contamination of gas industry sites. Kevin is presently at Oak Ridge National Laboratory, where he will spend up to one year working on mercury contamination issues with Dr. Ralph Turner. He is also working on his Ph.D. degree through the UND Department of Geology and Geological Engineering.

Gale Mayer (MS ’88, PhD ’92), is a program manager and hydrogeologist at the EERC. His principal research areas include the impacts of agricultural chemicals on groundwater and soil and water remediation technologies. Other research has included waste management, wastewater treatment, and the gasification and combustion of low-rank coals. He served as chairman of the Groundwater Quality Session at the 1994 North Dakota Water Quality Symposium and has authored or coauthored papers presented at the Northern Great Plains Water Management Workshop, the North Dakota Water Quality Symposium, and the Midwest Groundwater Conference.

Wesley Peck (MS ’92), EERC research associate, coauthored a paper with Joe Hartman of the EERC and Allen Kihm of Minot State University on the stratigraphy of the Nessos Anticline in northwestern North Dakota and presented the paper at the North Dakota Academy of Science meeting last April. He conducted field studies on the Cretaceous and Tertiary stratigraphy and paleontology in and around Makoshika State Park in southeastern Montana. He is assisting in the development of a geographic information system (GIS) program at the EERC. He is managing data accumulation on the lignite observations in the northern Great Plains and integrating the data into database and GIS formats. He is also using computer graphics programs to create various geologic oriented diagrams.

Craig Schmit (BS ’70), is a senior research manager at the EERC. During the past year, he continued to be involved in the Rocky Mountain underground coal gasification (UCG) test program, groundwater program research for the gas
industry, and a sour gas plant remediation program for the Canadian oil and gas industry. He also initiated a Canadian project focused on alkanolamine contamination in the subsurface and worked with several colleagues to increase the EERC’s involvement in UCG activities in both the U.S. and abroad.

James Sorensen (BS ‘91), a geologist at the EERC, has been conducting field work as part of the Center’s project with the Gas Research Institute studying mercury contamination in soils and groundwater. He is also involved in research on the subsurface transport and fate of wastes associated with natural gas processing, and the impact of agricultural chemicals on groundwater.

Ed Steadman (MA ‘85), deputy associate director, manages research projects and coordinates research activities related to geosciences at the EERC. He is also responsible for preparation and presentation of research publications, reports, and proposals.

Rod Stoa (formerly NDGS), EERC research specialist in resources and strategic planning, has been involved with the Center’s groundwater program for the Gas Research Institute. He has co-authored reports dealing with produced water and drilling waste management. He coauthored a poster on these topics which was presented by Dan Daly this past summer in Denver.

Chris Zygarlicke (MS ‘87), is working as a project manager on several research projects that seek solutions to ash deposition problems in utility boilers. He’s also a heavily involved in research related to toxic metal emissions during coal and waste combustion. He has authored a peer-reviewed paper for publication in the Journal for the Institute of Fuel and has coauthored three articles in a book published this year by Taylor and Francis. He is also presenting a paper this year at the joint AFRC/JFRC Pacific Rim International Conference on Environmental Control of Combustion Processes in Maui, Hawaii.

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**ALUMNI NEWS**

**1940’s - 1950’s**

Bob Aaker (BS Geol ’49) visited the Department in March while a granddaughter participated in a national swim meet at UND. He also took the opportunity to visit a brother in Lakota, and sisters in Hatton and Fargo. Bob is enjoying retirement!

William Blain (BS Geol ’55, MS ’68) has retired as Director of the NDSU Memorial Union. I suspect that Bill and Ginny will enjoy retirement! Best wishes!

Dennis Thomte (BS Geol ’57) received recognition in the UND Alumni Review as one of the country’s top patent attorneys. We are pleased to hear about you, Dennis. Congratulations!

**1960’s**

Rodney Feldmann (BS ’61, MS ’63, PhD ’67) continues to travel in his research on decapod crustaceans of the Southern Hemisphere. He spent the summer of 1993 in Argentina (NSF) and early this year in New Zealand (Nat. Geographic Soc.). He is currently past president of the Paleontological Society and at Kent State he is
Professor and Assistant Chairman. We continue to read papers by Rod; he is an efficient and productive researcher. Keep it up, Rod!

Tom Hamilton (MS '67, PhD '70) is again active as Trustee of his undergraduate college, Capital University, Columbus, and is President of Pennzoil Exploration and Production Co. Tom and Carolyn continue to be generous to our Department, for which we are very grateful.

Jim Hollarn (BS Geol '64) drops by the Department once or twice/year lately on visits to his parents and the rest of his family. He has become very active in the San Diego Geological Soc. and continues to interact with Tim Giles (BS '72), who is responsible for finding groundwater resources for a number of agencies. They both are learning how important it is to educate the public and keep them informed at all stages of their projects. Jim has been auditing courses at SDSU and developing his expertise in GIS for SAMDA. It is always good to see you, Jim!

K. Bruce Switzer (BS '66, MS Biol '69) has been switched! He no longer does geology, but is an administrator (Monitoring and Agreements Officer) with Environment Canada! He and Katherine have two children, Ken (1969) and Mary (1972). Unfortunately, someone has to administer and we know you were chosen because of your strong abilities, not to fulfill the Peter Principle!

1970's

Palmer Bailey (BS Geol '70, BSGE '80, MS '80) was the invited speaker for the Department's annual spring banquet, sharing impressions of his visit to Antarctica to inspect the activities of his people there. As Commander of the U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover, NH, Palmer has had the opportunity to visit many of the research sites under his supervision. His assignment is now over and Palmer and his family are making plans to move back to their land in Alaska where Palmer is a Registered Professional Engineer. Best wishes to you in your retirement, Palmer!

Kip Carroll (MS '78) is general Chairman of the 7th International Williston Basin Symposium, scheduled for July 1995 in Billings, MT.

Roger Reede (BS '59, MS '67, PhD '72) spent from December '93 through July '94 teaching at the Akita, Japan, campus of SW Minnesota State University. We look forward to hearing of your experiences, Rog.

Ron Rovenko (BS '77, MS '82) stopped by with his children to report that he is enjoying Tuscaloosa, Alabama, after doing geology in Wyoming for many years. Working with Quintana Petroleum, Ron is involved in the methane from coal project. (The company used to burn it off; now they recover and sell it!) It was good to see you, Ron!

Frank Schulte (BS '65, MS '71, PhD '72) reports that he completed his assignment on "outsourcing" for Exxon and is now involved with the Europe-Russia Business Unit, essentially a technical assignment, with some continued responsibility for regional synthesis and corporate "fire-fighting". Frank and Cindy's daughter Maren graduated this Spring from Notre Dame in Chemical Engineering and daughter Jen is starting her 3rd year at Princeton in Environmental Engineering. It is always good to hear from someone from Jud, ND!
Richard Smith (BS '67) is still with Richland Energy, in petroleum exploration. He has been in Calgary now for at least 20 years, according to his daughter, Kori, who is an undergraduate major in our Department. Kori is one of several children of alumni, carrying on the tradition at UND. Dick and his wife enjoy hiking and skiing. Good to hear about you, Dick, and we’re delighted to have Kori with us!

1980’s and 1990’s

John Dahl (BS ’87) and Jeff Solheim (BSGE ’89) reportedly are very successful in their new company, Itasca Environmental/Agassiz Petroleum, characterizing and remediating petroleum contamination sites in northern Minnesota. Great to see development of your entrepreneurial abilities, guys! Congratulations!

Brett Fossum (BSGE ’82) continues to work for Conoco (Houston). His several trips to Angola this past year have made him appreciate what we have here much more! We all take too many things for granted.

John Hoganson (PhD ’85) was the Ferguson Lecturer at St. Lawrence University this past Spring. He is also the State Paleontologist for North Dakota!

Tina Langtry (MA ’82) is continuing to succeed as Vice President and General Manager of Exploration for Conoco-Norway, Inc. in Stavanger, Norway. This is one more example of how highly our graduates are respected, especially in these times of "down-sizing" of the petroleum industry. We are proud of your achievements, Tina. Hope you have had time to visit Bergen and Finse!

Paula Leier-Englehardt (BS GeoL. ’82) called to update us on her activities with STS, Inc. in Green Bay, WI, where she is Senior Consultant. Her work includes siting landfills, developing data bases to manage the myriad of data, some extending over many years now, and setting up training programs for soil and water sampling procedures. She also enjoys making presentations on her work to area schools. She and Steve are competing at the National Rowing Regatta in Augusta, GA this month. We anxiously await the results, Paula!

Mark Lord (MS ’84, PhD ’88) is excited that another position has been authorized for the Department at Allegheny...after two years of rejection of that request. Son, Josh, is in the 3rd grade, and daughter, Cassie, must be entering 1st grade this year. Patty keeps busy babysitting, skating, and organizing craft fairs.

Jeff Maletzke (MS ’88) reports that he is being given increasing amounts of responsibility with Donohue (and increasing degree of stress at times!). However, he continues to enjoy his work and still finds time to enjoy his growing daughter, Nichole. Penny coaches and teaches, as before. Glad to hear all is going well, Jeff.

Brian Sandberg (MS ’85) continues to work for CRA (Conestoga Rover) outside of Minneapolis. His work takes him to New Jersey and Arizona but most of his sites are in MN. Heidi now works for Dakota County developing resources for disabled adults. Son, Peter, is almost 4 yrs old and claims to play hockey for K-Mart for $100! (and I thought K-Mart pays only $50!). Brian brought us up to date on other alumni in the area: John Betcher (BS ’71, MS ’89) works for the Minnesota Pollution Control Agency (MPCA). Dave Brown (MS ’83) is with SEACOR and recently had twin daughters; he also has a young son. Moira Campion (MS ’92) is with the
Minnesota Department of Natural Resources, while husband Paul Bulger (MS '87) is with STS Consultants. Mark Elliott (MS '91) is with GME Consultants. Steve Giddings (MS '86) also works with the MPCA in their air quality division. Stacy Harwell (BS Environ. Geol. Technology '94) is with Braun Intertek. Tim Huber (MS '86) (see below). Mark Millsop (MS '85) is with GME Consultants, but works out of Crosby, MN. (Brian reports that Mark's and Joni's 14-yr old son, Luke, is about 6 ft tall and is on a baseball team). Camie Pederson (BSGE '89) works for Delta Environmental. Larry Quandt (MA '90) works for MPCA as part of its site-response system. Dave Ronnel (MS '87) is another on the Delta Environmental team.

If any of these facts are in error let us know (sometimes we intentionally include errors to get you to write!). If there are others in the Minneapolis area whom we have omitted please let us know. (NB see Lynn Kelley, below)

Tim Huber (MS '86) reports that he and Nancy are the proud parents of Jessica (b Sept. 1993). They recently moved into a brand new home in Lino Lakes, Mn. Tim continues to manage the Environmental Health and Safety Division at Delta Environmental Consultants, while Nancy has incorporated "Eye for Design", a graphic design and illustration company. Always glad to hear such good news, Tim!

Jodie (Stiening) Kelly (BSGE '84) and Fred Kelly (BSGE '84) have two children, Michelle (7/88) and Karl (7/89). They don't write about their work in Brownswood, TX, though!

Lynn Kelley (MS '80) recently visited Ed Murphy (BS '79, MS '83). Lynn, wife Laurie, and 2 yr-old son John, were in Bismarck to participate in a Bon Spiel. Ed reports that Lynn has abandoned the mineral industry in favor of the "slop on top", as a geologist with an environmental consulting firm in Minneapolis (DPRA). He works mainly on underground tank remediation.

Camie Pederson (BSGE '89) has joined Baywest Consulting Co., out of the twin cities, where her report-writing abilities have made her in high demand. She has kindly sent employment ads on environmental geology so our students could see the present opportunities in that area.

Brian Silfer (MS '90) and his wife (October 1994 wedding, according to Larry Quandt (MA '90)) have started their own company in Syracuse, Environmental Strategies. Congratulations and best of success, Brian!

Kent Wiken (BSGE '84, BS '86) is working out of Fort Worth, TX with EMCON Baker-Shiflet, Inc., an environmental company. He stopped by in July to invite students to apply for positions in the company. We especially appreciate the loyalty of our alumni who bring job opportunities to the attention of our students. Thanks, Kent!

**UND**

GSA Alumni Gathering

**October 25, 1994, 5-7 p.m.**

Bud and Mardi Holland's room
Plaza Park Suites
1011 Pike St.

48
Aaker, Robert K. (BS Geol 1949)
Aase, Glenn D. (BSMIE 1941)
Abercrombie, Harry (EG&T 1994)
Achtien, Donald B. (BSMIE 1953)
Ackerman, Daniel J. (BS Geol 1971)
Adams, Jimmie L. (MST 1969)
Albers, Daniel C. (BSMIE 1960)
Alexander, Debra J.
Alme, Karyn (BS Geol 1994)
Alpha, Andrew G. (BS 1934 MS 1935)
Anderson, Alan R. (BSGE 1982)
Anderson, Ben A. (BSMIE 1938)
Anderson, Curtis A. (MS 1976)
Anderson, Curtis R. (BSGE 1982)
Anderson, Douglas B. (BS 1975 MS 1988)
Anderson, Jr., Henry W. (BS Ed 1953)
Anderson, Garth S. (MS 1980)
Anderson, Orin J. (PhD 1961)
Anderson, Richard J. (BS 1981)
Anderson, Robert O. (BS 1981)
Anderson, Rolf C. (BSMIE 1933)
Anderson, Sidney B. (PhB 1951)
Archbold, F. Michael (BS 1968)
Armbruster, Joseph S. (BSMIE 1960)
Armentrout, Howard D. (PhB 1964)
Armentrout, Ralph H. (BSGE 1977 BS 1977)
Armkt, Michael B. (PHD 1975)
Arnold, Arthur B. (BS Geol 1950)
Badley, David A. (BSGE 1983)
Bailey, Terrence P. (BS 1970)
Bakke, Arne A., Jr. (BS Geol 1982)
Bakken, Wallace E. (BS Geol 1958 MS 1960)
Balcom, Robert J. (BA 1976)
Baldwin, Rae Ann
Ballard, Frederick V. (MA 1963)
Barbie, Dana L. (BSGE 1976)
Barke, Walter B. (BS Geol 1950)
Barnes, John G. (BSMIE 1961)
Bartelma, Robert D. (MST 1969)
Bass, Louis L. (BSMIE 1922)
5295 S Youngfield Court Littleton CO 80127
1220 Elmwood Drive Walnut Creek CA 94596
3702 Berkeley Dr # 4 Grand Forks ND 58203
2451 Hodges Bend Circle Sugarland TX 77479
2207 Daraa Street Idaho Falls ID 83402
3019 Milton Road Montgomery AL 36110
6504 Camille Ave Dallas TX 75252
1524 Mahan Ave Richland WA 99352
RR 2 Box 137 Park River ND 58270
2145 29th St S Grand Forks ND 58201
3455 S. Corona # 826 Englewood CO 80110
604 6th St N Wahpeton ND 58075-3857
502 E Diamond Farmington NM 87401
6817 Calverton Drive Hyattsville MD 20782
3807 South County Rd 1135 Midland TX 79701-9060
3835 S Flinders St Aurora CO 80013
1017 E 49th St Tulsa OK 74105-4611
4105 Brigadoon Drive St. Paul MN 55126
691 Shelter Bay Dr LaConner WA 98257
606 Bryn Mawr NE Albuquerque NM 87106
805 So J Street Pensacola FL 32501
% HLS PO Box 9022 Ahmadi 61001 KUWAIT
1018 4th Ave North Wahpeton ND 58075
2904 Chestnut Street Grand Forks ND 58201
INTL School Islamabad Sector H9/1 Bx 1124 Islamabad PAKISTAN
48 Mc Nab Park Street Brooks AB T0J 0J0 CANADA
PO Box 305 Sun Rise Beach MO 65079
17818 Terranova West Dr Spring TX 77379
899 Pearl St # 6 Denver CO 80203-3321
21260 Via Colombard Sonoma CA 95476
3925 Cedar Ridge Dr Bedford TX 76021
HC73 Box 14 Post Mills VT 05066
411 Raintree Trail LaFayette LA 70507
PO Box 83183 Fairbanks AK 99708
551 S. Williams Denver CO 80209
16181 Cairo Circle Placencia CA 92670
12 Prescott Ln. Georgetown, MA 01833
3412 E 57th Street Tulsa OK 74135
13811 Glade Hollow Drive Houston TX 77014
123 NW 41st Street Seattle WA 98107
3301 Seawind Dr. Anchorage AK 99516
1514 Lehmberg Blvd Colorado Springs CO 80915
P.O. Box 631 Newport WA 99156

49
Baudalis, Frederick W. (BSGE 1971)
Bauer, A. Gordon (BS Geol 1951)
Bauer, James A. (BS 1977)
Baumann, Rodney (MA 1985)
Baxter, Charles M. (MST 1976)
Beal, William A. (BSGE 1983 MS 1986)
Beaver, Frank W. (BSGE 1984 MS 1984 PhD 1986)
Beck, Holly M. (BS 1979)
Becker, Donald A. (MS 1965 PhD 1968)
Beckman, Michael W. (BA 1939)
Beckwith, Douglas C. (BS 1984)
Beeks, Clifford H. Jr. (BS 1966 MBA 1978)
Beeks, Wayne R. (BSMIE 1962)
Beiers, Jan C. (BS 1960)
Bell, Gordon L.
Benson, Bradley T. (BSGE 1988)
Berg, James A. (BS 1979)
Berg, Larry D. (BS Geol 1960)
Bergan, Gail R. (BS Geol 1979)
Berglund, Almit D. (BS Geol 1970)
Bertram, Ronald E. (BSGE 1970)
Betcher, John T. (BS 1971 MS 1989)
Beyers, Ron H. (BS 1968)
Bickley, William B. Jr. (MS 1970 PhD 1972)
Blnde, Scott (BSGE 1984)
Binegar, Randall D. (BSGE 1983)
Bique, Stephen F. (BSGE 1983)
Birk, Emmet C. (BA 1937)
Bjorlie, Peter F. (BS 1976 MS 1978)
Bjorlie, Sidney C. (BS Geol 1973)
Blain, William S. (BS Geol 1955 MS 1968)
Bleau, Dale J. (BS 1972)
Bleth, Craig J. (BSGE 1988)
Block, Douglas A. (PhD 1965)
Bluemle, John P. (PhD 1971)
Bluemle, Mary E. (MST 1967 EdD 1975)
Blum, Raymond L. (BS Geol 1957)
Boettger, William (MA 1986)
Bohan, Timothy W. (BS 1981)
Bohn, James D. (BSMIE 1961)
Bohn, Paul D. (BA Geol 1987)
Bohrer, Mark F. (BSGE 1985 BS 1985)
Bolinske, Jean M. (BS 1984 BSGE 1984)
Bolstad, Erling M. (BSMIE 1939)
Bonneville, John W. (BS Geol 1956 MS 1961)
Botnen, Barry (BS EG&T 1994)

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5523 Brighton Place New Orleans LA 70131
1740 Begonia Casper WY 82604
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736 Princewood Court Baton Rouge LA 70806
3720 Cherry St #A1 Grand Forks ND 58201
RR1 Box 326 Bismarck ND 58501
21706 Edgevale Place Elkorn NE 68022
567 N Marlborough Circle Shreveport LA 71106
RR1 1177 235th Street Baldwin WI 54002
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PO Box 650202 Dallas TX 75265
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1902 N Washington #6 Bismarck ND 58501
551 Birchwood Dr Bismarck ND 58504
Box 162 Bowbells ND 58721
10118 Duchess Dr Houston TX 77036-8600
RR 1 Box 200-G Buffalo WY 82834
Box 305 Ashby MN 56309
3040 Minnehaha Pkwy E Minneapolis MN 55406
6889 Bruce Rd Celina OH 45822
19 Turtle Rock Ct The Woodlands TX 77381-4800
136 12th St. SE Washington DC 20003
1964 N 20th St Bismarck ND 58501-2368
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5346 S Magnolia Terrace Whittier CA 90601-2332
7401 NW 107th St Oklahoma City OK 73132
7237 S Independence Littleton CO 80123
2414 Broadway Fargo ND 58102
HCR 5 Box 7B Roseau MN 56751
207 5th Ave NW Mandan ND 58554-3139
2301 Harlem Crest Road Rockford IL 61111
2714 Mercury Lane Bismarck ND 58501
2714 Mercury Lane Bismarck ND 58501
10150 E Harvard #E-338 Denver CO 80231-3963
241 Redstone Hill Rd #B7 Bristol CT 06010
188 Riverwood St Richland WA 99352
6311 Avery Island Austin TX 78727
42 Lee Dr Ringgold GA 30736
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PO Box 134 Williston ND 58801
7910 W Becher West Allis WI 53219
18115 27th Ave N Plymouth MN 55447
Braaten, Dennis A. (BSGE 1979)
Brandjord, Irwin M. (PhB 1956)
Braun, Stephen M. (BSGE 1983 MS 1991)
Breitling, Barbara
Brekke, David W. (MA 1979)
Brekke, Jay (BSGE 1991)
Brekke, Karla (BSGE 1982)
Brevik, Eric (BS 1992 MS 1994)
Breza, Michael (BSMIE 1954)
Brinster, Kenneth F. (MS 1970)
Brostuen, Erling A. (PhB 1965)

Brouillard, Lee A. (BS 1977)
Brown, David J. (MS 1983)
Brown, Michael W. (BS 1992)
Brown, Paul (BS Geol 1993)
Brown, Rae Ann (BS 1984)
Brown, Ronald G. (BS 1968)
Brown, Todd (BS 1990)
Budzeka, Gail R. (BS 1979)
Buechler, Barbara J. (BA 1965)
Bulger, Jeffrey W. (BS 1981)
Buigler, Paul (MS 1987)
Burke, Randolph B. (PhD 1989)
Burkhardt, Barry W. (BS 1972)
Burkholder, Brad Lee (BS 1987)
Bushaw, Dewey J. (BS 1957)
Byerly, Francis (BSMIE 1943)
Callender, Edward (MS 1964 PhD 1968)
Camara, Michael (MS 1977)
Cameron, David A. (BS 1975)
Campion, Moira E. (MS 1992)
Caramanica Frank P. (PhD 1973)
Carlson, Clarence G. (Kelly) (MS 1960)
Carroll, William K. (MS 1978)
Carter, John L. (BS 1959)
Carter, Kristine (MA 1985)
Catt, Diane M. (MA 1982)
Cayler, Bryan (BS Geol 1993)
Chasney, William J. (BS Geol 1955)
Cherlet, Ronald C. (BS 1971)
Cherski, Bennett A. (BSMIE 1955)
Cherven, Victor B. (MS 1973)
Chipera, Angela
Chipera, Steven (MS 1985)

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1043 S Oakcrest Ave Casper WY 82601
36 Santee Rd Lincoln ND 58504
409 SW Red Hills Drive Dundee OR 97115
2508 S 10th Street Grand Forks ND 58201
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SEE MARCHELL
3700 Patricia Dr Apt. 17 Irbandale IA 50322
106 Washington Harbor Dr Washington NC 27889
4100 Shiloh Dr NE Albuquerque NM 87111
Asst. Dir. Energy & Minerals Field Inst
Colorado School of Mines Golden CO 80401
7121 Rockcress Ct NW Albuquerque NM 87120-4103
488 Montrose Ln St Paul MN 55116
625 S State St Marengo IL 60152
814 NE 16 1/2 St Jamestown ND 58401
SEE BALDWIN
9012 E Amherst Drive #A Denver CO 80231
4533 Wyman Dr Sacramento CA 95821
SEE BERGAN
SEE BREITLING
847 Jennifer Dr Knoxville TN 37938-4663
10446 Sherman Dr Eden Prairie MN 55347-4444
RR 3 Box 19A Mandan ND 58554
387 W 1125 N Centerville UT 84014-3005
RR 2 Box 153 Grand Forks ND 58203-9680
16515 Manningtree Ln Spring TX 77379-6843
213 N Ridge Hills Ct Grand Forks ND 58201
6194 Katella Ave Las Vegas NV 89118
1510 Chatham Colony Reston VA 22090
PO Box 1664 Polson MT 59860
52 Riverview Heights Mandan ND 58554
10446 Sherman Eden Prairie MN 55437
6610 Glenn Lakes Drive Houston TX 77069
1163 West Ave B Bismarck ND 58501
2412 Pine St Billings MT 59101-0533
121 Pikemont Drive Wexford PA 15090
1034 Briarrose Dr Baton Rouge LA 70810-5124
2700 NE 125th St #306 Seattle WA 98125
814 Campbell Dr Grand Forks ND 58201
807 Gateway Drive Winnipeg MB R5K 3S5 CANADA
10912 123rd St Edmonton AB T5M 0C9 CANADA
2513 Luciernaga Street LaCosta CA 92099
3764 Toronto Rd Cameron Park CA 95682
2896-A Walnut Street Los Alamons NM 87544
2896-A Walnut Street Los Alamons NM 87544
Chmelik, James C. (MA 1960)
Christensen, Dale W. (BA 1981)
Christensen, Dean (BSGE 1979)
Christensen, Odin D.
Christensen, Robert E. (BS Geol 1958)
Christiansen, Robert A. (BS 1971)
Christofferson, Donald D. (BSMIE 1951)
Christopherson, Susan (BS 1985)
Christy, Donald G. (BSMIE 1953)
Chu, Min

Clark, Michael (MA 1966)
Clayton, Lee (BS Geol 1960, MS 1962)
Coffman, Richard C. (BS 1952)

Collier, Cynthia (BS Geol 1987)
Collier, James C. (MS 1988)
Comeskey, Allen (MS 1993)
Conner, Donald C. (BS Geol 1963)
Conner, John D. (BA 1973)
Cook, Charles W. (BS Geol 1968 MS 1974)
Crackel, Alan J. (PhB 1957 BA 1959)
Crashell, John J. (MS 1991)
Crawford, Jack (BS Geol 1965 MS 1967)
Cron, James (BSGE 1990)
Crosby II, Spurgeon C. (MA 1958)
Cross, Timothy A.
Crow, Robert K. (BS Geol 1955)
Crowder, Bridget (BS EG&T 1993)
Cummings, Francis W. (BS 1974)
Cutler, Percy (PhB 1957).
Cvangarda, Alain M. (BS 1955 MS 1957)
Dahl, Dale (Ex 1977)
Dahl, John (BS 1987)
Dale, Jeffrey L. (BA 1986)
Daly, Daniel (MS 1984)
Dammen, Todd (BSGE 1984)
Danielson, Roderick W. (BSMIE 1935)
Davidson, Jerry P. (BS 1960)
Davis, Edward E. (M Ed 1968)
Deal, Dwight E. (PhD 1970)
Deats, Stewart A. (BS Geol 1988)
DeBoer, Daniel A. (BS 1978 BA 1978)
Degenstein, Joel A. (BS Geol 1976 MS 1978)
Delimata, John J. (MS 1969 PhD 1975)

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1699 Peachcrest Ct. Lawrenceville GA 30243-2860
225 Nottoway Dr. Mandeville LA 70448-1515
5549 S Lisbon St. Aurora CO 80015-3631
103 Rue Acadian. Slidell LA 70461
3316 Newkirk Drive. Plano TX 75075
5907 Wood Sorrel Court. Burke VA 22015
801 6th St N. Grand Forks ND 58203
729 Terrance Drive. Grand Forks ND 58201
8200 North Laurel Glen Blvd #1503
Bakersfield CA 93311
3707 Hickory Knob Dr. Humble TX 77339-1947
5717 Tolman Terrace Madison WI 53711
12220 Bonaventure Dr. SE Calgary AB T2J 2V7
CANADA
2028 Stanford Ct. Los Banos CA 93635-9569
2028 Stanford Ct. Los Banos CA 93635-9569
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335 Calle Loma Norte. Santa Fe NM 87501
403 Presbytere Pky. Lafayette LA 70503
6248 S Niagara Court. Englewood CO 80111
Rainy River ON. POW 1L0 CANADA
137 Heath St. Buffalo NY 14214-1119
100 Drakes Landing Rd #250. Greenbrae CA 94904
(No current address)
209 Piney Ridge Road. Waveland MS 39576
4996 Bear Mountain Drive. Evergreen CO 80439
2652 Osborn Rd. Topeka KS 66614
1221½ Cherry Street. Fort Collins CO 80521
PO Box 55. Brainerd MN 56401
350 Huron. Toronto ON. M6S 2G3 CANADA
4920 South Oak St. Casper WY 82601
4032 Ella Ave. Great Falls MT 59405
5303 Birchmont Dr NE. Bemidji MN 56601-5724
Route 1 Box 34. Savonburg KS 66772
114 Chestnut St. Grand Forks ND 58201
440 N Airport Rd. Hastings MI 49058
6230 Tuckerman Lane. Colorado Springs CO 80918
1720 S Garrison St. Lakewood CO 80226
2220 Valkyrie Drive NW. Rochester MN 55901
PO Box 3154. Carlsbad NM 88221
2445 Glen Circle. Grand Forks ND 58201
1509 S Little Ave #204. Cushing OK 74023
2613 Crossvine Circle. The Woodlands TX 77380
PO Box 10. Stanley ND 58784
1509 E Warren. Kingsville TX 78363
Delling, Thomas (BS 1980)
Delzer, Francois (BA 1964 BSMIE 1958)
Delzer, Louis C. (PhB 1961)
Deruchter, Kenneth N. (MS 1973)
Desautels, Herman J. (PhB 1949)
DeYaefer, Wilfred M. (BS 1956)
Diede, Loren L. (BA 1974)
Dietz, Mary E. (BS 1984)
Divita, Robert L. (BS Geol 1971)
Dockter, Craig A. (BSGE 1983)
Doebbler, Krista A. (BSGE 1984)
Dow, Wallace G. (MS 1964)
Ducharme, Paul J. (BSMIE 1940)
Dukart, Thomas X. (BSGE 1978)
Dumonneaux, Gayle (MS 1984)
Dunman, Joseph (BSMIE 1959)
Dunsworth, Robert A. (BSMIE 1955)
Durall, Rebecca (MS 1987)
Dykema, Merrill E. (MST 1970)
Eastwood, David K. (BS Geol 1987)
Effeland, Jon N. (MA 1973)
Eifelund, Robert T. (BSGE 1981)
Ekren, Einar B. (BS Geol 1949)
Ellington, Jon (BS Geol 1993)
Elliott, Mark (MS 1991)
Elofson, Richard R. (BS Geol 1963)
Elshau, Angela (BS 1983)
Emmans, Dale C. (MST 1975)
Endres, Joel A. (BS 1972)
Engbrecht, Eric F. (BS 1949)
Englerth, Edward (BS Geol 1958)
Ensminger, Robert H. (PhB 1958)
Erickson, A. Kirst (BS Geol 1967 MS 1970)
Erickson, J. Mark (MS 1968 PhD 1971)
Erickson, Jerrold J. (BS Geol 1976)
Erickson, Margaret O. (BA 1939)
Erickson, Peter W. (BSMIE 1957)
Erickson, Ronald L. (BSGE 1959)
Erickson-Bique, Stephen (BA BSGE 1983)
Evans, Brian (BA Geol 1993)
Evenson, Leif E. (BS BSGE 1987)
Facca, Fosco V. (BS 1970)
Faflak, Richard E. (BS Ed 1975 MA 1979)
Faigle, George A. (MS 1964)
Falcke, Sharon K. (MA 1983)
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11564 Babitt Ave Granada Hills CA 91344
3516 Varal Rd NW Calgary AB T3A 0A5 CANADA
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1437 Oxford Houston TX 77008
PO Box 5024 Sacramento CA 95817
23 Huntsman's Horn Circle The Woodlands TX 77380
3257 S 102nd Street Omaha NE 68124
734 18th Ave W Kirkland WA 98033-4818
2111 Robb St Lakewood CO 80215-1252
3107 W Willow Knolls Dr #21A Peoria IL 61614
8860 Roseville Dr Richmond BC V7A 2K3 CANADA
1609 State St Midland MI 48640-5501
PO Box 725 St Francis MN 55070
PO Box 3055 Winnemucca NV 89446
200 Sugarwood Drive Knoxville TN 37922
RR 5 Box 78AA Detroit Lakes MN 56501
14545 SW 126th Ave Tigard OR 97224
550 Carlton Court Grand Forks ND 58203
P.O. Box 47081 Plymouth MN 55447
30908 5th Place S Federal Way WA 98026
SEE CHIPERA
401 6th Ave NE Osseo MN 55369
2155 Northridge Drive N Mankato MN 56003
1526 N Yeso Circle Hobbs NM 88240-4633
1214 N 1st Street Bismarck ND 58501
4523 Alton Place NW Washington DC 20016
314 N Spruce St Ogallala NE 69153
15 Church Street Canton NY 13617
1704 Amber Rd Killeen TX 76543
SEE OROS
RR 1 Box 234-G Spearfish SD 57783
2315 Tanglel Houston TX 77005
26404 Ingleside Shr Rd Ingleside IL 60041
711 14th St Havre MT 59501
20955 Jamestown Ave Lakeville MN 55044-8683
2098 S 38th Street Grand Forks ND 58201
(No current address)
1307 13 1/2 St N Moorhead MN 56560-1627
3403 W Ohio Midland TX 79703
SEE MILLER
53
Falkenstein, George (BA 1931 MS 1945)
Farquharson, Philip (BS Geol 1975)
Farringer, Dale (BA 1938)
Farris, Robert S. (MA 1984)
Fashbaugh, Earl F. (MS 1979)
Feldman, Robert H. (Ex 1962)
Fender, Thomas J. (BS 1982)
Fendt, Paul (BSGE 1981)
Fenner, William (MS 1974 PhD 1976)
Federer, David A. (BS 1982)
Ferguson, Lori H. (MA 1984)
Fischer, David W. (MS 1980)
Fischer, Howard J.
Flewitt, William E. (BS Geol 1967)
Fohr, Deborah K. (BA 1973)
Folke Dahl, Jonathon S. (BS Geol 1987)
Forsgren, Frank M. (BS Geol 1980)
Forsman, Nels F. (BS Geol 1974 PhD 1985)
Foss, Craig (BS 1983)
Foss, Stuart B. (BS 1973)
Fossum, Bret (BSGE 1982)
Foster, Henry J. (BS 1986)
Fox, Jon (MS 1993)
Fredrickson, Dean (BSGE 1985)
Freeman, Margaret (BA 1989)
Freisatz, Wayne (MS 1991)
Friestad, Harlan K. (BS Geol 1966 MS 1969)
Friestad, Mark B. (BS Geol 1970)
Frison, David A. (BS E&G&T 1993)
Froehlich, Charles (BSMIE 1960)
Froelich, Lawrence (BS Geol 1964)
Frye, Charles I. (PhD 1967)
Fuller, Thomas C. (BS 1980 MS 1982)
Fulton, Clark (MS 1976)
Furman, Marvin J. (MS 1970)
Fyten, Alice E. (MA 1949)
Gableman, Paul D. (BS Geol 1954)
Galkjen, Norman Eugene (BS 1987)
Galambos, William E. (BS Geol 1958)
Garaas, Howard (BS 1942)
Garske, Jay T. (BS Geol 1957)
Garske, Jeffrey W. (BSGE 1976)
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3547 Lowell St San Diego CA 92106-1716
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4329 Oakley St Duluth MN 55804
3045 Myrtle Drive Billings MT 59102
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24104 SE 35th PL Issaquah WA 98027-6300
4706 Briar Bend Road Houston TX 77035
1765 S Union Blvd Lakewood CO 80228-3971
9508 Cloverhurst Dr St Louis MO 63123-5411
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1422 Crossfield Dr Katy TX 77490-4036
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821 W Avenue “A” Bismarck ND 58501-2446
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RR 2 Box 251 Hopkins MO 64461-9086
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2921 S Ledbetter Pl Kennewick WA 99337-2534
3479 Ross Road Palo Alto CA 94303
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1583 S Spruce St Denver CO 80201
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Joyce, James L. (BSGE 1986)
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Kehew, Alan E.
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Kelly, Fred Baker (BSGE 1984)
Kenaley, Douglas S. (MS 1982)
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Kichline, Robert D. (PhB 1968)
Kiefer, Duane J. (BSGE 1984)
Kiefer, Paul L. (MST 1973)
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Klaus, Elmer J. (BS Geol 1957)
Kleesattel, David R. (MA 1985)
Klemmer, John N. (BS Geol 1952)
Klotzkin, Charles E. (Ex 1963)
Knauss, Wayne L. (BS 1950)
Knudson, Benjamin D. (BS 1979)
Knudson, Bruce E. (BS Geol 1975)
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Koch, Michael S. (BS 1985)
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127 N State St Springfield IL 62702-4842
4937 Purdue Avenue NE Seattle WA 98026
3427 Livingston Dr Jefferson MD 21755
2103 W 12th St #B Austin TX 78703
1205 Hermitage Road Colonial Heights VA 23834
8313 Shadowood Lane Broken Arrow OK 74011
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7010 Centre Oaks Dr Houston TX 77069-2225
5083 Evergreen Street Portage MI 49002
17185 Hershey Ct Lakeville MN 55044
4319 Woodland Pk Brownwood TX 76801
1825 Dukes Dr Midland TX 79705
1812 1st Ave North Grand Forks ND 58203
TX Bur of Economic Geol Austin TX 78712
911 Church Street Roselysford PA 19468
1420 N 13 Street Bismarck ND 58501
13 Bon Price Lane St Louis MO 63132
16813 126th Ave SE Renton WA 98058
726 Oak Street Grand Forks ND 58201
9272 Scrub Oak Dr Littleton CO 80124
PO Box 376 Clear Lake SD 57226
2361 Rockne Dr Concord CA 94518-2522
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65 Norman Avenue Lake Hiawatha NJ 07034
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113 Sand Dollar Dr Vallejo CA 94591-7245
1520 Country Lane Bismarck ND 58501
8070 Scholar Drive Baton Rouge LA 70809
5757 Standish Ave South Minneapolis MN 55417
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Laird, Wilson M. (summer)
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Langtry, Tina M. (MA 1982)
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Murphy, Edward (BS 1979 MS 1983)
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723 Ironwood Richmond TX 77469
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Scardigli, Wayne E. (BSGE 1968)
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Schaner, Ryan (BSGE 1994)
Schaper, Edwin H. (BS 1981)
Schiffelbein, Paul A. (MSEx 1979)
Schmellfinger, Carrie (BS 1983)
Schley, Carleton C. (PhB 1969)
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Schmid, Roger W. (BS 1960)
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Wolff, Robert A. (BSGE 1982) 4415 Crown Point Road Mandan ND 58554
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Zimmerman, James T. (BS Geol 1955) 6905 Edenvale Blvd Eden Prairie MN 55346
Zodrow, Dwain M. (BS Geol 1950) 1112 South Main Minot ND 58701
Zygan, Christopher J. (MS 1987) 835 Great Plains Ct Grand Forks ND 58201
GEOLUMNI INFORMATION FORM
Please type or print.

Please fill out and return to the address on the back as soon as possible.

<table>
<thead>
<tr>
<th>Name</th>
<th>Residence Telephone</th>
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<td>Surname</td>
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<th>Residence Address</th>
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<td>Street Address</td>
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<td>Position</td>
<td>Business Telephone</td>
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| Company Address | City | State | Zip |

Permanent Address (or name and address of parents, nearest relative, or someone who will be able to reach you):

<table>
<thead>
<tr>
<th>Name</th>
<th>Relationship</th>
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| Street Address | City | State | Zip |

Degree College or University Year
Degree College or University Year
Degree College or University Year

Spouse
Name Year of Wedding

Children
Name Birth Date Name Birth Date
Name Birth Date Name Birth Date

On the back of this sheet please send us any news of your "doings" to be included in the next issue. Tell us about some incident or recollection you remember from your days in the Department, e.g., the time Bud Holland shot a hole in his car. Or, in any event, return this sheet so our records will be more complete and current. We want to hear from you!

November, 1994