



Quaternary Geologist and Geomorphologist

NEWSLETTER OF THE QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

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RESULTS OF 1987 DIVISION ELECTION

A total of 1,020 ballots were mailed to the Division's voting affiliates for the 1987 election of officers and Panel members, and 348 valid ballots were returned. Of these, five were returned too late to be counted, and the Panel-member vote on several others could not be counted because the affiliate voted for too many candidates (the limit is three). Division officers and Panel members elected for 1987 are:

Chairman James C. Knox
 First Vice-Chairman Dale F. Ritter
 Second Vice-Chairman Kenneth L. Pierce

Panel members (1987-89) Jon C. Boothroyd
 Jon J. Clague
 W. Hilton Johnston

NOMINATIONS FOR THE 1988 PANEL MEMBERS

Clip out and mail this ballot before November 15, 1987, to:

Richard F. Madole
 U.S. Geological Survey
 Box 25046, MS 966
 Denver, CO 80225

All members except Division officers, present or retiring Panel members, and Student Associates are eligible for nomination to the Panel. The six names receiving the highest number of nominations will appear on the annual ballot. Each voting affiliate of the Division (member other than Student Associate) may nominate up to three persons.

(1) _____
 (2) _____
 (3) _____

 Name of Nominator

DIVISION FINANCIAL STATEMENT FOR CALENDAR YEAR 1986

Financial condition of the QG&G Division
as of December 31, 1986

QG&G Division Fund		
Fund Balance 12/31/85		\$ 880.24
Dues Income thru 12/31/86		2574.00
Total Division Resources		\$3454.24
Division Expenses	\$2871.02	
Funds transferred to Mackin Fund 12/31/86	291.61	
Total deductions		\$3162.63
Adjusted Division Fund Balance as of 12/31/86		\$ 291.61
J. Hoover Mackin Appropriated Fund		
Fund Balance 12/31/85		\$8273.86
Earnings and Contrib.	\$ 456.35	
Division Fund Transfer	291.61	
Total Income		\$ 747.96
Grant Awards		(\$1000.00)
J. Hoover Mackin Fund Balance as of 12/31/86		\$8021.82

MACKIN GRANT APPLICATIONS FOR 1988

The deadline for receipt of applications for the Mackin Grant for research in geomorphology or Quaternary geology is February 15, 1988. Two awards will be made, one to a Master's degree candidate and one to a Ph.D. candidate. Winners will be selected by April 15, 1988.

Application forms may be obtained from the Division Secretary, Richard F. Madole, U.S. Geological Survey, Box 25046, MS 966, Denver, CO 80225.

1987 MACKIN GRANT WINNERS

Nineteen applications for Mackin Grants were received in 1987. Eight applications were from M.S. degree candidates and eleven were from Ph.D. candidates. The scoring of applications from Ph.D. candidates resulted in a tie. The tie was resolved by dividing the grant money equally between the two applicants.

The M.S. degree candidate selected to receive a Mackin Grant is Kevin M. O'Dea, Department of Geology, Humboldt State University, Arcata, California. O'Dea will study "Quaternary terrace formation and deformation on Yager Creek, Humboldt County, California" under the supervision of Gary A. Carver.

The two candidates selected to share a Mackin Grant are Leal A. K. Mertes, Geology Department, University of Washington, Seattle, and Jim E. O'Connor, Department of Geosciences, University of Arizona, Tucson. Mertes will study the "Morphology and construction of the Solimoes-Amazon River flood plain in Brazil" under the supervision of Thomas Dunne. O'Connor will study the "Hydraulics and sediment transport of Pleistocene Lake Bonneville flooding on the Snake River" under the supervision of Victor R. Baker.

1987 MACKIN GRANT COMMITTEE

Applications for Mackin Grants are evaluated by a committee of seven composed of the four members of the Management Board and three At-Large members. The three At-Large Committee members are appointed by the Division Chairman and serve for one year.

The At-Large Committee members for 1987 were:

G. Robert Brakenridge
Edward A. Keller
Robert M. Thorson

The Division is indebted to these three individuals for their good work and their willingness to serve.

RECIPIENTS OF THE MACKIN GRANT 1974-1986

- 1974 -- **Louis D. Carter**, University of Southern California, "Quaternary geology in Baja, California".
- 1975 -- **Phillip Davis**, University of Colorado, "Cirque glacier fluctuations and lacustrine chronologies".
- 1976 -- Award date changed.
- 1977 -- **Daniel R. Muhs**, University of Colorado, "Marine terraces-soil development, San Clemente Island, California".
- 1978 -- **Lisa Osterman**, University of Colorado, "Quaternary geology of Frobisher Bay, Baffin Island".
- 1979 -- **Donna Marron**, University of California, Berkeley, "Slope processes in Redwood National Park".
- 1980 -- **Lucy L. Foley**, Western Washington University, "Loess and paleosol stratigraphy in eastern Washington".
- 1980 -- **Susan L. Gawarecki**, Lehigh University, "Origin of the Railroad Ridge diamicton".
- 1981 -- **Mary L. Gillam**, University of Colorado, "Age and climate effects on soil development, Colorado and New Mexico".
- 1981 -- **Julie Brigham**, University of Colorado, "Chronology of Pleistocene marine deposits in coastal Alaska".
- 1982 -- **Thomas F. Bullard**, University of New Mexico, "Quaternary geomorphic evolution of a tributary to the Chaco River, northwestern New Mexico".
- 1982 -- **J. Steven Kite**, University of Wisconsin, "Late-glacial and Holocene alluvial chronology, St. Johns drainage basin, northern Maine and southern New Brunswick and Quebec".

- 1983 -- **Johathan M. Harbor**, University of Colorado, "Chronology of Holocene events, geomorphic response, and eolian influx in alpine lakes in the Front Range, Colorado".
- 1983 -- **David S. Shafer**, University of Tennessee, "Quaternary climatic change, landscape evolution, and paleoecologic history, southern Appalachians, western North Carolina".
- 1983 -- **Carolyn H. Eyles**, University of Toronto, "Scarborough Bluffs, Lake Ontario basin, lithofacies codes and the model of diamict deposition below floating ice".
- 1984 -- **Jim E. O'Connor**, University of Arizona, "Paleohydrology and hydraulics as interpreted from geologic evidence: Boulder Creek, Utah".
- 1984 -- **Leonard H. Thorleifson**, University of Colorado, "The Quaternary stratigraphy of the Hudson Bay lowlands".
- 1985 -- **Karin A. Hoover**, University of Washington, "The relation of fluvial processes to facies: the Holocene stratigraphy and sedimentology of the Wells Reservoir area, eastern Washington".
- 1985 -- **Peter D. Lea**, University of Colorado, "Late-Quaternary stratigraphy and paleoenvironments of the Nushagak region, southwestern Alaska".
- 1986 -- **Mark A. Gonzalez**, University of Wisconsin, "Fluvial geomorphology, geochronology, and paleoclimatology of Paddock Creek, Little Missouri Badlands, southwestern North Dakota".
- 1986 -- **Christopher M. Menges**, University of New Mexico, "Systematic and quantitative analyses of the landforms of a mountain front within a basin and range landscape in the northern Rio Grande rift near Taos, north-central New Mexico".
- 1986 -- **Dorothy L. Sack**, University of Utah, "Geomorphology of alluvial fans in the Bonneville Basin, Utah: modeling alluvial fan activity".

COLE MEMORIAL RESEARCH AWARD APPLICATIONS FOR 1988

The Gladys W. Cole Memorial Research Award is for investigations of the geomorphology of semiarid and arid terrains in the United States and Mexico. It will be given each year to a GSA Fellow between 30 and 65 years old who has published one or more significant papers in geomorphology. Funds cannot be used for work already accomplished, but recipients of a previous award may reapply if additional support is needed to complete their work. The minimum amount of the award has been increased to \$2,500.

Application forms for the Cole Award may be obtained from the Research Grants Administrator, The Geological Society of America, P.O. Box 9140, Boulder, CO 80301; Phone (303) 447-2020. Applications must be postmarked by February 15, 1988. (No qualified applications were received during 1987.)

KIRK BRYAN AWARD FOR 1987

Ten papers were considered for the Kirk Bryan Award for 1987. The winning paper is by Richard B. Waitt, Jr. (1985) "Case for periodic, colossal jokulhaupts from Pleistocene glacial Lake Missoula": Geological Society of America Bulletin, v. 96, p. 1271-1286.

This paper is an important contribution for several reasons. Particularly significant is Waitt's reconstruction of the history recorded by backwater deposits and their interlayering with Mount St. Helens volcanic ash, which presents a wholly new concept of flood succession and provides firm dates for temporal relationships that were only guessed at previously. Furthermore, Waitt provides an excellent

quantitative explanation for periodic release of floods from Lake Missoula involving filling rates of the partly discharged lake waters and the behavior of the ice dam.

The Kirk Bryan Award for 1987 will be presented at the Division luncheon, Wednesday, October 28th, at the Annual Meeting of the Society in Phoenix, Arizona.

NOMINATIONS FOR THE KIRK BRYAN AWARD FOR 1988

Nominations for the Kirk Bryan Award for 1988 will be accepted until December 1, 1987. Nominations are made by writing a letter that identifies and provides a statement about its significance. Send nominations to the Division Secretary, Richard F. Madole, U.S. Geological Survey, Box 25046, MS 966, Denver, CO 80225. The Kirk Bryan Award is for a specific work published within the past 5 years. The work may be by a single author or several authors.

1987 DISTINGUISHED CAREER AWARD: ALEKSIS DREIMANIS

Aleksis Dreimanis is one of the most accomplished and widely recognized Quaternary and glacial geologists in the world. He has spearheaded the recent surge of new ideas on the genesis and classification of glacial sediments through his presidency of the INQUA Commission on Lithology and Genesis of Quaternary Deposits. He is also a past president of AMQUA. Together with Dick Goldthwait (the inaugural recipient of this award) and other colleagues, he was instrumental in developing the North American Great Lakes Quaternary stratigraphic succession, to which most subsequent records have been compared. His nearly 200 publications span six decades, cover a wide range of topics, and many are widely quoted. Numerous awards bestowed upon him include two honorary D.Sc. degrees and two teaching awards. His students hold important positions throughout North America.

Now in his seventies, Aleksis still does fieldwork, supervises graduate students, teaches graduate courses, travels, and corresponds with colleagues all over the globe. At international meetings, silence and tremendous respect falls over the audience when Dreimanis speaks. This tireless energy devoted to a "profession and hobby" of studying and promoting Quaternary and glacial geology to the world would be appropriately recognized with the Distinguished Career Award.

ACKNOWLEDGMENTS TO PANEL MEMBERS RETIRING IN 1987

As Division Secretary and Chairman of the Panel, Richard Madole, on behalf of the Division, wishes to acknowledge the service of those Panel members whose terms expire in 1987. They are:

Robert J. Fulton
Thomas C. Gustavson
Louis J. Maher, Jr.

These individuals were members of two panels (1986 and 1987) that evaluated Kirk Bryan Award nominations with exceptional efficiency. They also assisted in evaluating nominations for the first two Distinguished Career Awards and in deciding on procedures to be adopted in determining this award. Our thanks to you for jobs well done.

DEADLINE FOR RECEIPT OF NEWSLETTER NEWS

Newsletters are mailed in March and September of each year. Members wishing to use the Newsletter as a means of communicating with the Division membership must provide the information to the Division Secretary by January 15 for inclusion in the March Newsletter and by July 20 for inclusion in the September Newsletter.

PLANS FOR PHOENIX GSA MEETING

The Geological Society of America annual meeting in Phoenix (October 26-29, 1987) will be an exciting occasion for Quaternary geologists and geomorphologists. We will have the biggest program in our history. Over 140 abstracts were submitted: 64 in geomorphology, 69 in Quaternary geology and 11 in glacial geology. This compares to the previous highs of 39 in geomorphology, 63 in Quaternary geology and 7 in glacial geology.

Of course, not all the abstracts can be accepted, but this overwhelming response insures excellent presentations that demonstrate the vitality of our disciplines.

The Division symposium will be unique this year. It focuses on the national and international initiatives for research in "Global Change: A Geological Perspective on Earth-System Science". Quaternary geology and geomorphology are key disciplines for this effort; the geochemists, geophysicists, etc. don't yet seem to know it.

TUESDAY, OCTOBER 27, 1987
(Full-Day Session)

GSA SYMPOSIUM (PLANETARY GEOLOGY; QUATERNARY GEOLOGY, AND GEOMORPHOLOGY DIVISIONS): GLOBAL CHANGE—A GEOLOGICAL PERSPECTIVE ON EARTH-SYSTEM SCIENCE

James W. Head, Raymond E. Arvidson,
and Victor R. Baker, Presiding

Morning Session

Francis P. Bretherton	
Earth-System Science	8:00
Don L. Anderson	
Mission to Planet Earth: An integrated approach to whole earth studies.....	8:30
W.G. Ernst	
New research opportunities in global geosciences	9:00
James C.G. Walker	
The geological record of atmospheric evolution	9:15
B.K. Lucchitta, J.A. Bowell, K. Edwards, W.M. Eliason, and H.M. Ferguson	
The Polar regions: Antarctic exploration from space	9:45
James W. Head	
Global tectonics on the terrestrial planets: A planetary perspective on earth-system science	10:00
Kevin Burke	
Tectonics, plate boundary zone (PBZ's) and earth-system science	10:30

- Richard J. O'Connell**
Mantle convection, plate motions and seismic heterogeneities in the mantle 11:00
- Ralph Kahn**
What we must do to cope with all that data 11:30

Afternoon Session

- Erick J. Barron**
Alternatives to modern atmosphere-ocean circulation in the geologic record 1:30
- Mark F. Meier**
Global change and global ice 2:00
- Stephen C. Porter**
Quaternary science and global change 2:30
- Malcolm K. Hughes**
Tree rings as records of paleo-environment 3:00
- Victor R. Baker**
Cataclysmic geomorphological processes and global change 3:30
- Raymond E. Arvidson**
Toward a global inventory of the composition of the continental crust 4:00
- Arthur L. Bloom, Bryan L. Isacks**
The shape of the Andes 4:30

FIELD TRIPS OF INTEREST TO DIVISION MEMBERS, 1987 GSA ANNUAL MEETING, PHOENIX, ARIZONA

Premeeting Field Trips

- Terraces of the Lower Salt River Valley in Relation to the Late Cenozoic History of the Phoenix Basin, Arizona**--T.L. Pewe, Arizona State University, Tempe, Arizona. 1 day. Limit: 35 participants. Estimated cost: \$65.
- Archaeological Geology of the Paleo-Indian Sites in Southeastern Arizona**--M.R. Waters, Texas A&M University, College Station, Texas; C.V. Haynes, Jr., University of Arizona, Tucson, Arizona. 2 days. Limit: 40 participants. Estimated cost: \$122.
- Paleoecology and Taphonomy of Recent to Pleistocene Inter-tidal Deposits, Gulf of California**--K.W. Flessa, University of Arizona, Tucson, Arizona; A.A. Ekdale, University of Utah, Salt Lake City, Utah. 3 and one-half days. Limit: 30 participants. Estimated cost: \$229.
- Late Pleistocene Alluvium and Megafauna Dung Deposits of the Central Colorado Plateau**--L.D. Agenbroad and J.I. Mead, Northern Arizona University, Flagstaff, Arizona. 4 days. Limit: 16 participants. Estimated cost: \$256.
- Large-Scale Silicic Volcanism of the Jemez Mountains and Geology of the Adjacent Rio Grand Rift, New Mexico**--S. Self and J. Wolff, University of Texas, Arlington, Texas; Jamie Gardner and Fraser Goff, LANL, Los Alamos, New Mexico. 3 days. Limit: 42 participants. Estimated cost: \$259.
- Selected Hydrogeologic Problems in Central Arizona**--T.L. Holzer, U.S. Geological Survey, Menlo Park, California; M.R. Lluria, Boyle Engineering Corporation, Phoenix, Arizona. 1 day. Limit: 45 participants. Estimated cost: \$59.

Postmeeting Field Trips

- Geology of the Lower Grand Canyon and Upper Lake Mead by Boat--An Overview**--F.W. Bachhuber and S. Rowland, University of Nevada, Las Vegas, Nevada. 3 days. Limit: 45 participants. Estimated cost: \$539.

Land Subsidence and Earth Fissure Formation in Eastern Maricopa and Northern Pinal Counties, Arizona--T.L. Pewe, Arizona State University, Tempe, Arizona; H. Schumann, USGS, Water Resources Division, Phoenix, Arizona; R.H. Raymond, Tempe, Arizona. 1 day. Limit: 35 participants. Estimated cost: \$51.

Late Cenozoic Mammal Faunas and Magnetostratigraphy, Southeastern Arizona--E. Lindsay, University of Arizona, Tucson, Arizona; N.D. Opdyke, University of Florida, Gainesville, Florida; N.M. Johnson, Dartmouth College, Hanover, New Hampshire. 2 days. Limit: 40 participants. Estimated cost: \$134.

Upper Holocene Alluvium of the Southern Colorado Plateau--R. Hereford, USGS, Flagstaff, Arizona. 3 days. Limit: 30 participants. Estimated cost: \$262.

DIVISION COCKTAIL PARTY, 1987 ANNUAL MEETING, PHOENIX, ARIZONA

The Fourth Annual QG&G Division Cocktail Party will be held Tuesday, October 27, 1987 from 7:30-10:30 p.m. This event provides a unique opportunity for Division members to gather and socialize leisurely in a congenial atmosphere. The 1986 party was a huge success; let's make this year's get-together the same.

SOIL MICROMORPHOLOGY WORKING GROUP MEETINGS IN USA--1988

Plans are underway for the ISSS (International Society for Soil Science) Subcommittee B Micromorphology Working Group meetings to be held in San Antonio, Texas, scheduled for July 10-15, 1988. In concert with the ISSS, the Soil Science Society of America is cosponsoring the meetings with the Soil Conservation Service and the USAID Soil Management Support Services. The following topics are under consideration for the program: vertisols; aridisols; hydromorphic soils; soils enriched with carbonates, gypsum, and other salts; micromorphological techniques in teaching and research; degradation and synthesis of minerals; micromorphological applications to agronomic and earth sciences; and paleopedology. Presentations will include invited papers, and volunteered papers and posters. There are also plans for a 6-day field trip in central Texas and, tentatively, field trips in the northeastern and north-central United States and in south-central New Mexico.

Chairman of the Organizing Committee is L. P. Wilding, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843. He would welcome comments and suggestions on the program. Liaison with GSA is Vance Holliday, Department of Geography, Science Hall, University of Wisconsin, Madison, WI 53706.

RESPONSES TO "MESSAGE FROM THE CHAIR" (QGG Newsletter, March 1989)

I read and enjoyed your "Dull message from the Chair" (Rambling thoughts . . .) in the last QG&G, but I hardly know how to respond to your query "What do you think?"

So far as my perception of attitudes within my own department, I feel that your diatribe is right on. In fact, it isn't strong enough. This department started out with a

pretty well-balanced "western-style" curriculum. That is, with a strong emphasis on field studies. Over the years, though, the paleontology wing has drifted into studies of living organisms and the geology wing has come increasingly under the domination of theoretical and experimental types. For several years, Bob Matthews and I have been agitating for the next faculty position, if there should ever be another, to be devoted to geohydrology. This idea won some kind of grudging acceptance for a while—when there seemed to be no chance for a new position. Recently, though, as the possibility of a new position has become a bit less remote, the T & E types have changed the potential new position from geohydrology to something like fluid dynamics; they think they want a person knowledgeable about fluids under high temperature and pressure who can interface with them in studies of "crust and mantle evolution".

In my view, the increasing quantification in research studies in Quaternary geology and geomorphology have not softened their attitudes toward our field. I perceive that such efforts to make our "superficial" studies more rigorously scientific have largely fallen on deaf ears. I fear that it is not our approach to Quaternary geology and geomorphology that renders them superficial; it is the "superficial" subject matter itself. We can't change that, so how can we possibly deal with these attitudes?

"A concern" indeed.

Dr. Charles Higgins
Department of Geology
University of California
Davis, CA

I wish to respond to your "Concern" and "Outrageous proposal" in the QG&G Newsletter. My perception of the situation is colored by employment in an Earth Sciences (Geography-Geology) Department—more on that later. I do, however, agree with the concern. In sending out a recent flyer promoting our program, I was struck by the number of schools which lack any semblance of a geomorphologist. This included both Ivy League schools and "cow colleges", so the problem is not unique to "snooty" schools. Possible explanations for the phenomenon are twofold: the extent of the discipline and its familiarity.

With due apologies to a number of eminent individuals, there has not been a true geomorphologist since G.K. Gilbert. With scales of observation now ranging from 10^{-10} m (weathering studies) to 10^{10} m (planetary geology), in time from the distant past (paleoenvironmental reconstruction) to near future (natural hazards evaluation), and of frequency from constant (solution) to nearly catastrophic (bolide colli-

sion), no one individual can integrate the field. Because we are concerned (by definition) with the Earth's surface, we cannot yet generate sound predictive models; climatic change consistently defeats us. Thus we find ourselves repeating Gilbert's incisive observations and deductions on progressively more specialized topics. Even the requirements of professional advancement (funding and promotion/tenure) mitigate against developing an intradisciplinary outlook.

The fragmentation of the discipline has been abetted by the contempt (bred by familiarity) shown for descriptive geomorphology by uninitiates. An analog might serve here. Geography is popularly viewed as map-making, thus as a sterile discipline kept alive only by political unrest. In actuality, Geography is a vibrant field of interactions between humans and their political, biological, and physical environment. It is being poached upon, however, by biologists (ecology), physicists (meteorology), and sociologists among others. These specialist disciplines have apparently discovered that it is in interactions that the elegance of natural systems lies, so they are attempting to re-invent the wheel.

Similarly, geomorphology suffers from a poor image. Because all geologists can describe a terrace, it is implicitly understood, and it is assumed that one would contact an engineering geologist to determine whether it is, in actuality, abandoned. One might contact an archaeological geologist to interpret paleoenvironments, or a ground-water geologist to evaluate water availability. Yet each of these disciplines is largely a spinoff of geomorphology.

I hope, however, that there is yet a niche for a generalist in surface processes. My guess is that, if your "outrageous proposal" were acted upon, we would find the same science being undertaken under a different guise, such as that of sedimentology to interpret paleoenvironments or geophysics to reconstruct glacial models. If we wanted to perpetuate "superficial geology" as a generalist field, we might consider honoring these individuals (such as J. H. Bretz, R. L. Shreve, and R. P. Sharp) who have made notable contributions to more than one of the numerous subfields of geomorphology. Logically, it should be the G. K. Gilbert Award. We might sponsor them on a lecture series in which they would speak to a wide range of academic, technical, and lay audiences on a range of topics, apparently unconnected save by the thread of earth-surface processes and landforms.

That's what I think.

William W. Locke
Assistant Professor, Geology
Department of Earth Sciences
Montana State University
Bozeman, MT 59717

UNIVERSITY OF COLORADO, BOULDER CENTER FOR GEOCHRONOLOGICAL RESEARCH

The University of Colorado at Boulder has recently awarded the Institute of Arctic and Alpine Research (INSTAAR) a \$440,000, 4-year grant from the Program Enrichment Fund as seed money in the development of the Center for Geochronological Research, a consortium of analytical research laboratories. Current activities are focused in three areas: (1) fundamental research in geochronological methodologies, (2) the development of site-specific chronologies to link local sequences into a global perspective, and (3) enhancement of undergraduate and graduate education by offering state-of-the-art facilities and guidance for inde-

pendent and collaborative research. We have a strong emphasis on multidisciplinary research in such areas as Quaternary environmental change, geoarchaeology, sea-level histories, and neotectonics.

The Geochronology Center faculty includes G.H. Miller—Director (amino-acid geochronology, radiocarbon dating of organic carbon isolated from carbonates), R.C. Walter (fission-track dating, tephrostratigraphy, K/Ar and Ar/Ar dating), S.L. Forman (thermoluminescence dating), Mark Noble (dendrochronology), G.L. Farmer (heavy-element isotope geochemistry), D. Muhs (uranium-series) and D. Goter (computer systems). In addition, we are currently recruiting a light-stable isotope geochemist and a dendroclimatologist.

**SIMON FRASER UNIVERSITY
Institute for Quaternary Research**

The Institute was founded 3 years ago by faculty from the departments of Archaeology, Biological Sciences, Chemistry, Geography, and Physics to promote and coordinate research and teaching in Quaternary studies. Surficial geologists from the Cordilleran Division of the Geological Survey of Canada have also played an active role in the institute. A lecture series has been instituted, workshops and field trips sponsored, and a Minor in Quaternary Studies will be started in September 1987.

**INTRODUCTION TO THE ALL-AMERICAN
PIPELINE ENVIRONMENTAL PROJECT**

This brief contribution introduces the geomorphology and Quaternary geology being conducted as part of the environmental/cultural resource plan for the All American Pipeline Project.

The All-American Pipeline is a 30-in.-diameter underground steel pipeline designed to carry heated crude oil from Pacific ports near Santa Barbara, Calif., to Freeport, Tex., just south of Houston. The western three-quarters of the pipeline has been constructed and buried; the eastern quarter is to be initiated. When completed the line will be approximately 2,650 km (1,650 mi) long. Environmental regulations require the entire pipeline to be buried below the original ground surface so a continuous trench is excavated prior to construction. On average, the trench is about 1.4 m (4.5 ft) wide and 2 m (6.6 ft) deep, although exceptional areas were excavated to depths of 5-9.5 m (16.4-31 ft). The deeply excavated areas were necessary to run the pipeline under cultural (highways, aqueducts) and natural features (rivers). Natural topography was retained in the trench and pipeline construction. Most of the line, however, is across relatively flat desert expanses. Major mountainous areas are in coastal California (Coast Ranges) and west-central California (southern Sierra Nevada).

The pipeline trench allows observing and sampling of the upper 2 m of surficial geological units along the corridor through the Southwestern United States. Field studies and sample collection progressed in close association with right-of-way clearance and trench excavation--largely from August 1985 to May 1986. Generally interesting localities, as expressed in the trench wall, were sought out, described, and sampled. Special emphasis was placed on the longer (i.e., vertically thicker) sequences or those with the greatest number of discernible units. The studied locales constitute a geo-environmental profile. Overall distribution of the geo-environmental profiles is about 1 per 16 km (10 mi) of trench length. Additionally, known and newly discovered archaeological occurrences were recorded and related to adjacent geological strata. The geo-environmental profile consists of defined strata in scale drawings; tabular, semi-quantitative soil/sediment descriptions; vertical and horizontal sample locations; and brief comments on local vegetation, geomorphology, and sedimentology. Samples were collected for various soil/sediment analytical procedures as well as prioritized pollen and radiocarbon analyses. As an example of the data base, the western 1,060 km contains 128 geo-environmental profiles and approximately 815 samples, for an average of about 6.4 samples per profile (though considerable variability exists in number of samples per profile).

The basic aim of our geomorphological and paleoenvironmental research is to provide the environmental framework for archeological studies. Similar emphasis will be placed on the theoretical aspect of site setting and preservation versus destruction based on empirical observations of buried and surficial features and their relation to depositional/erosional regimes. Most of the above considerations must be approached through detailed analysis of local and regional geomorphic systems, long- and short-term paleoenvironmental records, and relationships of site-specific and regional soil-stratigraphic units. Through extensive field documentation (already completed) and detailed analysis of samples (in preliminary phases), we hope to characterize at least the upper 2 m, and in some cases considerably more, of the region spanned by the pipeline. Preliminary analysis, in the form of constructing regional stratigraphic frameworks and large-scale soil catena diagrams, some of which are now radiocarbon calibrated, is encouraging and is leading to new and promising research proposals in geomorphology, geochronology, paleoseismology, lake sediment chemistry, fluvial processes, applied microstratigraphy, theoretical stratigraphy, and the list goes on. As natural byproducts of the geoarchaeology work, these topics will be addressed, though generally on a more local scale.

Geo-environmental research on this project is largely being coordinated by Joseph Schuldenrein. Joe is overseeing individual work by specialized researchers in remote sensing, faunal analysis, palynology, geoarchaeology, and sample analysis, to name just a few. As principle field investigators and research consultants, John Poneczynski and I will be providing support and syntheses in geomorphology, paleopedology, Quaternary stratigraphy, and geochronology. John is basically responsible for the eastern segment (east of Tucson, Ariz.) whereas I will analyze the western part. Interested persons are encouraged to contact me at the address below for more information or suggestions.

J. Kelly Cluer
Quaternary Consultants
7625 E. Pecan Street
Tucson, AZ 85730-4305
(602) 748-2797

WORKSHOP ON "DIRECTIONS IN PALEOSEISMOLOGY"

During the past decade, earth scientists from a wide variety of disciplines have become increasingly involved in studying the effects of prehistoric earthquakes. These studies have made vital contributions to a national program to evaluate the hazards and minimize the potential losses from major earthquakes. On April 22-25, 1987, 72 geoscientists from academic institutions, the business community, and government agencies met in Albuquerque, New Mexico, to discuss the past achievements, current status, and future goals of the rapidly evolving, new sub-discipline of paleoseismology. The workshop, sponsored by the U.S. Geological Survey, provided a timely forum to discuss the present and future contributions of paleoseismology. The format for the workshop consisted of a series of concise reviews of pertinent topics by knowledgeable scientists followed by extended open discussion sessions.

Most of the geologic evidence of major prehistoric earthquakes is preserved in Quaternary deposits or interpreted from geomorphic features. Thus, topics related to QG&G play a key role in paleoseismic studies. Following

stimulating keynote addresses by Bob Wallace (USGS) and Clarence Allen (Cal Tech), speakers in the initial session reviewed the status of both conventional and experimental Quaternary dating techniques. Throughout the meeting, a recurring point of concern and discussion was the reliability and uncertainties of various dating techniques. New techniques offer the hope of dating a wider variety of deposits, and providing improved resolution and calibrations for relative dating methods.

Subsequent technical presentations and discussion sessions dealt with the problems of recognizing and characterizing individual paleoseismic events in the geologic record, the difficulties with estimates of Quaternary slip rates and coseismic deformation, the variations in long-term and short-term behavior of seismogenic faults, and the application of paleoseismic data to various aspects of seismic-hazard analysis. The final panel discussion examined future needs and possible directions of paleoseismologic studies from the viewpoint of both practitioners and program managers. Paleoseismology has contributed far more to the accurate evaluation of seismic hazards than originally anticipated when the National Earthquake Hazard Reduction Program was established. The achievements of paleoseismology are gradually being recognized within the earth science community but, to maintain the support needed for continued vigorous research, it is important to increase the awareness of the general public.

The proceedings of the workshop will be published as a USGS "Redbook" Open-File Report edited by Anthony J. Crone. The volume will include short papers on topics described in the technical presentations and summaries of the panel discussions. Publication of the volume is expected in early 1988. For additional information contact Anthony J. Crone, USGS, Box 25046 DFC, MS 966, Denver, CO 80225.

THE WORKING COMMITTEE FOR INTERNATIONAL COLLABORATION IN GEOMORPHOLOGY

Introduction

This summary of Newsletters 2 and 3 on International Geomorphology, which also appears in Earth Surface Processes and Landforms (UK) and Physical Geography (USA), is a cooperative effort of the journal editors and publishers to reach as many of the World's geomorphologists as possible. Copies of the full newsletters have been sent to the corresponding members with the request that they distribute them within the countries they represent. The countries and corresponding members presently on our list are:

Country	Member
Algeria	M. Benazzouz
Austria	H. Fischer
Australia	J. Nanson
Belgium	L. Peeters
	A. Pissart
Brazil	L. Coltrinario
Canada	H. Heginbottom
	O. Slaymaker
Chile	J. Araya
China (PRC)	Shi Yafeng
Colombia	M. Hermelin
Czechoslovakia	M. Stankoviansky
Denmark	J. Kruger
Fed. Rep. Germany	D. Barsch
Finland	M. Seppala

France	J. Tricart
Greece	H. Maroukian
Hong Kong	C. So
Hungary	M. Pecsli
India	A. Nair
Israel	A. Yair
Italy	M. Panizza
Japan	T. Mizuyama
Kenya	D. Kapule
Mexico	A. Lopez
Nigeria	A. Faniran
Papua New Guinea	M. Sullivan
Portugal	C. Coelho
Romania	I. Ichim
Singapore	P. Wong
South Africa	B. Moon
Spain	F. Lopez-Bermudez
Sri Lanka	C. Madduma Bandara
Sweden	A. Rapp
The Netherlands	E. Koster
Turkey	O. Erol,
	M. Karabiyikoglu
United Kingdom	A. Werrity
United States	J. Knox
Venezuela	L. Vivas
Yugoslavia	I. Gams
USSR	V. N. Kotlyakov

Please send them your questions and thoughts about International Geomorphology. If you do not have your representative's address, write to the following individual for that information:

H. J. Walker, Secretary
c/o Department of Geography
Louisiana State University
Baton Rouge, LA 70803 USA

You will notice that a number of countries are not listed; e.g., Cuba, Egypt, German Democratic Republic, Iceland, Korea (both North and South), Tanzania, and others. We would welcome correspondence from representatives of these countries as well as, of course, all others.

Progress on Activities Now Underway

The collection of names of geomorphologists for the International Directory is continuing. Although no precise count has yet been made, the total number of entries received to date is about 2,000.

The solicitation of your ideas on the kind of organization you think would best serve geomorphologists of the world continues. The possibilities being investigated include: (1) an International Association of Geomorphologists affiliated with ICSU, (2) an independent Society of Geomorphology, and (3) an informal organization. The decision on this topic, to be made in Frankfurt/Main in 1989, will certainly influence future developments in geomorphology. Please send your thoughts to:

Prof. D. Brunnsden, Chairman
Chairman of the Working Committee
Department of Geography
University of London
King's College, Strand
London WC2R 2LS, UK

In Newsletter 2, a series of short histories on the development of geomorphology in various countries was initiated with Geomorphology in Romania by I. Ichim. We plan on publishing these short histories in a volume to be distributed in 1989 at the Second International Conference on Geomorphology in Frankfurt/Main.

Proceedings of the First International Conference on Geomorphology

Under the title International Geomorphology 1986, John Wiley & Sons Ltd. has issued the proceedings of the First International Conference on Geomorphology. Edited by V. Gardiner, on behalf of the British Geomorphological Research Group, these proceedings fill two volumes.

News from Around the World

We have received news items from over a dozen countries on such geomorphologic topics and endeavors as (1) the progress being made in the formation of national and regional geomorphology organizations (Belgium, France, India, Italy, Spain), (2) the establishment of teaching and research exchanges as well as joint research programs between countries (Hungary, Italy, Poland), (3) the sponsorship of honors for theses in geomorphology (Poland), (4) the distribution of Newsletters within specific countries (China among others), (5) recent publications on geomorphologic topics, and (6) announcements of professional meetings of a geomorphologic nature.

Please, if you have news items from your country, send them to H. J. Walker so that they can be published in the Newsletter and thus become a part of the permanent record on International Geomorphology.



THE GEOLOGICAL SOCIETY OF AMERICA

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