



# Quaternary Geologist and Geomorphologist

NEWSLETTER OF THE QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

Volume 26, no. 2

September 1986

## RESULTS OF 1986 DIVISION ELECTION

A total of 1028 ballots were mailed to the Division's voting affiliates for the 1986 election of officers and Panel members, and 321 valid ballots were returned. Division officers and Panel members elected for 1986 are:

Chairman.....	Victor R. Baker
First Vice-Chairman.....	James C. Knox
Second Vice-Chairman.....	Dale F. Ritter
Secretary.....	Richard F. Madole
Panel members (1986-88).....	
	Parker E. Calkin
	William L. Graf

A tie vote for the third Panel member will be resolved at the meeting of the Division Management Board at the Annual Meeting in San Antonio, Texas, as prescribed by the Division Bylaws.

## DIVISION FINANCIAL STATEMENT FOR CALENDAR YEAR 1985

Financial condition of the QG&G Division as of December 31, 1985:

QG&G Division Fund	
Fund Balance 12/31/84	\$1090.89
Dues Income thru 12/31/85	2774.00
<hr/>	
Total Division Resources .....	\$3864.89
<hr/>	
Division Expenses	\$2104.41
Funds transferred to Mackin Fund 12/31/85	880.24
<hr/>	
Total deductions.....	\$2984.65
<hr/>	
Adjusted Division Fund Balance as of 12/31/85.....	\$ 880.24

J. Hoover Mackin Appropriated Fund	
Fund Balance 12/31/84.....	\$7857.06
Earnings and Contributions	\$ 536.56
Division Fund Transfer	880.24
<hr/>	
Total Income.....	\$1416.80
<hr/>	
Grant Awards .....	(\$1000.00)
<hr/>	
J. Hoover Mackin Fund Balance as of 12/31/85.....	\$8273.86

## NOMINATIONS FOR THE 1987 PANEL MEMBERS

Clip out and mail this ballot before November 15, 1986, 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

## MACKIN GRANT APPLICATIONS FOR 1987

The deadline for receipt of applications for the Mackin Grant for research in geomorphology or Quaternary geology is February 15, 1987. Two awards will be made, one to a Master's degree candidate and one to a Ph. D. candidate. Winners will be decided by April 15, 1987.

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

## 1986 MACKIN GRANT WINNERS

Eleven applications for Mackin Grants were received in 1986, four from M.S. degree candidates and seven 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. Both applicants also are recipients of other GSA funds.

The M.S. degree candidate selected for a Mackin Grant for 1986 is **Mark A. Gonzalez**, Department of Geography, University of Wisconsin, Madison. Gonzalez will study the "Fluvial geomorphology, geochronology, and paleoclimatology of Paddock Creek, Little Missouri Badlands, southwestern North Dakota" under the supervision of Professor James C. Knox.

The two Ph.D. candidates selected to share a Mackin Grant are **Dorothy I. Sack**, Department of Geography, University of Utah, Salt Lake City, and **Christopher M. Menges**, Department of Geology, University of New Mexico, Albuquerque. Sack will study the "Geomorphology of alluvial fans in the Bonneville Basin, Utah: modeling alluvial fan activity" under the supervision of Professor Donald R. Currey. Menges' study will involve "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" under the supervision of Professor Stephen G. Wells.

## 1986 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 1986 were:

**John J. Clague**  
**Nicholas Eyles**  
**John W. Whitney**

On behalf of the Division, I want to thank these three individuals for their good work and their willingness to serve.

## RECIPIENTS OF THE MACKIN GRANT 1974-1985

- 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".

## GLADYS W. COLE MEMORIAL RESEARCH AWARD FOR 1986

The Management Board of the QG&G Division evaluates applications received for the Gladys W. Cole Memorial Award. Two applications were received in 1986 and that of **Peter W. Birkeland**, University of Colorado, was selected for the Cole Award. Professor Birkeland will study the development of calcic soils on slopes of known age in a semiarid environment and the potential for using development of calcic soils for dating geologic hazards.

## COLE MEMORIAL RESEARCH AWARD APPLICATIONS FOR 1987

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 \$2,100. 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, 1987.

## FIRST DISTINGUISHED CAREER AWARD TO BE MADE IN 1986

The Distinguished Career Award was established in 1985 to recognize Quaternary geologists and geomorphologists who have demonstrated excellence in their contributions to science. **Dr. Richard P. Goldthwait** is the first recipient of the award, which will be presented at the Division Luncheon at the Annual Meeting of the Geological Society of America in San Antonio, Texas. The luncheon will be held on Wednesday, November 12, at 12:00 p.m. in the Salon del Ray Central of the Hilton Hotel.

The Quaternary Geology and Geomorphology Division of the Geological Society of America is pleased to recognize the continuing contributions of Richard P.

Goldthwait to the field of Quaternary geology by presenting him the first distinguished career award.

After receiving degrees at Dartmouth and Harvard and after a short time as a materials engineer with the U.S. Air Force, Dr. Goldthwait spent most of his professional career at The Ohio State University in Columbus. While there he was Professor of Geology, Chairman of the Department of Geology and Mineralogy, Acting Dean of the College of Arts and Sciences, and the first Director of the Institute of Polar Studies. He has received numerous awards recognizing his work in Quaternary geology, and particularly glacial geology, and has been active in many professional organizations.

Dr. Goldthwait has, since 1935, contributed significantly to our knowledge of glaciers and glacial deposits and has greatly influenced the direction of research in the field. In 1936 he published the results of the first successful seismic sounding through glacier ice. Since that time, this method, with numerous enhancements, has been used by others to determine ice thickness and the internal characteristics of glaciers.

Dr. Goldthwait has also been influential in the development of concepts of deglaciation of northern New England throughout his professional career. One of his major contributions in this regard has been the application of studies of modern glacier processes to the understanding of deglaciation. At a time when most glacial geomorphologists depended on deductive reasoning to interpret glacial landforms, Richard Goldthwait studied glacier processes in Greenland, Baffin Island, Alaska, New Zealand, and the Antarctic to better understand the development of Pleistocene landforms and deposits. His influential role in forming the Institute of Polar Studies at the Ohio State University in 1960 was a catalyst for greatly increasing the scope of polar research. His role in the development of a glaciology program in New Zealand in the late 1950's has had a similar effect on that country.

Richard Goldthwait has also had a major impact on the development of ideas concerning Quaternary history of the Midwest. He was among the first to use  $^{14}C$  dates in the development of the time stratigraphy of glacial deposits in Ohio. His work during the 1950's and 1960's with Forsyth, Dreimanis, and others still stands as a major accomplishment.

Dr. Goldthwait has always been an active member of the Friends of the Pleistocene, and he is also a friend of many former students and colleagues throughout the world. He continues to publish and be active in the field, and has recently led an INQUA field trip in Glacier Bay, Alaska.

The Quaternary Geology and Geomorphology Division is proud to recognize the achievements of **Richard P. Goldthwait**. Friends and former students of Dr. Goldthwait are urged to attend the luncheon and (or) plan to be present during presentation of the award.

#### KIRK BRYAN AWARD FOR 1986

Eleven publications were considered for the Kirk Bryan Award for 1986. The winning publication is that by Ronald I. Dorn and Theodore M. Oberlander, 1982, Rock varnish: Progress in Physical Geography, v. 6, no. 3, p. 317-367.

Ronald I. Dorn and Theodore M. Oberlander are being recognized for their work on rock varnish. They are responsible for some remarkable developments in the use of rock varnish as an absolute dating tool and as a recorder of environmental (climatic) change. In a series of papers that includes the award-winning paper, they have been the first to culture rock-varnish bacteria in the laboratory; they have developed two new rock-varnish dating techniques: radiocarbon dating of organics extracted from rock varnish and cation-ratio

dating; and they have developed three new methods for using rock varnish as indicators of fluctuations in climate that, respectively, utilize stable carbon isotopes, micromorphology of dust layers in rock varnish, and microchemical laminations in rock-varnish layers.

#### NOMINATIONS FOR THE KIRK BRYAN AWARD FOR 1987

Nominations for the Kirk Bryan Award for 1987 will be accepted until December 1, 1986. To nominate a paper for the Kirk Bryan Award simply identify the paper and provide 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. Note that the deadline for submitting nominations was changed in 1985. Previously, it was February 1.

#### ACKNOWLEDGMENTS TO PANEL MEMBERS RETIRING IN 1986

As Division Secretary and Chairman of the Panel, I want to thank, on behalf of the Division, those Panel members whose terms expire in 1986 for a job well done:

Steven M. Colman  
John E. Costa  
Margaret J. Guccione

#### 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.

#### DIVISION-SPONSORED SYMPOSIA, 1986 ANNUAL MEETING, SAN ANTONIO, TEXAS

The Division will sponsor a symposium entitled "**Quaternary evolution of the Mississippi Valley**" organized by James C. Knox and others. The Division has also endorsed an At-Large symposium entitled "**Late Cenozoic evolution of stream systems in the Western United States**" organized by Peter C. Patton and Thomas W. Gardner.

QUATERNARY EVOLUTION OF THE MISSISSIPPI VALLEY  
Tuesday, November 11, 1986, 1:30 p.m.  
Convention Center, River Room

- Introductory Remarks..... 1:30
- 1 R. C. Anderson: Periglacial Drainage in the Upper Mississippi Valley Region..... 1:35
- 2 D. A. Sundeen: Structural Controls and Age of the Lower Mississippi Valley..... 1:55
- 3 R. W. Baker: Evidence for an Early Pleistocene Minimum Age for the Upper Mississippi Valley..... 2:15
- 4 R. S. Lively and B. M. Olsen: Buried Valleys and U/Th Ages in the Upper Mississippi Valley: Minnesota..... 2:35
- 5 E. A. Bettis and G. R. Hallberg: Evolution of Valleys and Valley Fills in Eastern Iowa: Insights into Mississippi Valley History... 2:55
- Coffee Break..... 3:15

6	J. C. Knox: Evolution of Valleys and Valley Fills in the Driftless Area, Southwestern Wisconsin.....	3:30
7	E. R. Hajic: Late-Quaternary Alluvial History of the Lower Illinois Valley and Adjacent Middle Mississippi Valley.....	3:50
8	R. T. Saucier and L. M. Smith: Late-Wisconsinan and Holocene Evolution of the Lower Mississippi Valley.....	4:10
9	E. H. Grissinger: Valley Fill Sequences in Tributaries of the Lower Mississippi River.....	4:30
10	J. M. Coleman: Pleistocene and Holocene Sedimentation in Offshore Mississippi Deltaic Environments.....	4:50
-	Open Discussion.....	5:10

**FIELD TRIPS OF INTEREST TO DIVISION MEMBERS, 1986 ANNUAL MEETING, SAN ANTONIO, TEXAS**

Premeeting Trips

**Quaternary Geology and Geomorphology of the Rolling Plains, Texas Panhandle.** Thomas C. Gustavson, Robert W. Baumgardner, Jr., Chris Caran, and Edward Collins, Bureau of Economic Geology, University of Texas, Austin; and Walter Dalquest, Midwestern State University, Wichita Falls. Two and one-half days, Nov. 7-9. Cost: \$235, Lubbock to San Antonio; \$155 without airfare. Limit: 45 participants.

**Archaeological Geology of Classic Paleo-Indian Sites on the Southern High Plains, Texas and New Mexico.** Vance T. Holliday, Texas A&M University, College Station; Eileen Johnson, The Museum, Texas Tech University, Lubbock; Vance Haynes, University of Arizona, Tucson; and Glen Evans, Austin. Two and one-half days, Nov. 7-9. Cost: \$235, Lubbock to San Antonio; \$155 without airfare. Limit: 45 participants.

Post-meeting Trips

**Geologic and Geomorphic History of the Edwards Limestone Aquifer and Surface Drainage System, South-Central Texas.** Patrick L. Abbott, San Diego State University, San Diego, and Charles M. Woodruff, Jr., Austin. One day, Nov. 14. Estimated cost: \$60. Limit: 90 participants.

**South Texas Modern Depositional Systems.** John L. Russell and Jon A. Baskin, Texas A&I University, Kingsville. Three days, Nov. 14-16. Estimated cost: \$200. Limit: 45 participants.

For further information, contact Jerry Wermund, Bureau of Economic Geology, University of Texas at Austin, Austin, TX 78713, (512) 471-1534; Weldon Hammond, Division of Earth and Physical Sciences, Geology Program, University of Texas at San Antonio, San Antonio, TX 78285, (512) 691-5447; or Field Trip Coordinator, GSA headquarters.

**SHORT COURSES BY DIVISION MEMBERS, 1986 ANNUAL MEETING, SAN ANTONIO, TEXAS**

Glacial-Marine Sedimentation

Saturday, November 8, 1:00 to 6:00 p.m., continues 7:30 to 10:00 p.m.;  
Sunday, November 9, 8:00 a.m. to 5:00 p.m., Hilton

Intended for a broad spectrum of participants ranging from student to professional, this course will present an up-to-date summary of what is known about glacial-marine sedimentation. Emphasis will be on the diverse

nature of modern depositional environments and their resulting facies and deposits. Other discussions will analyze the temporal and spatial distribution of glacial-marine sediment in the rock record. The course will also include introductory sections that provide basic information about marine and glacial depositional environments. Hands-on core and seismic profile workshops will enhance the presentation. An informal reception will be held in conjunction with the workshop on Saturday evening.

Faculty: **Bruce F. Molnia**, Polar Research Board, National Research Council, National Academy of Sciences, and **John B. Anderson**, Department of Geology, Rice University. Fee includes course manual and Saturday evening reception. Limit: 100. Fee: \$100.

Computer Graphics for Geological Applications

Saturday, November 8, and Sunday, November 9 8:00 a.m. to 5:00 pm, Hewlett Packard

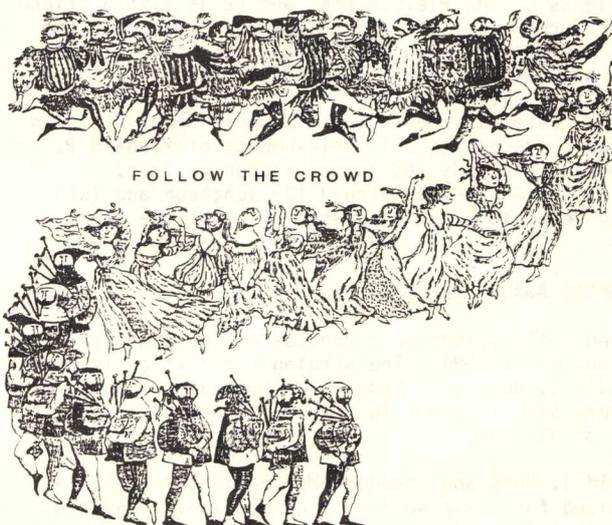
This course is designed for those familiar with personal computers, for those who have used a mainframe, or for those with a need to use specialized graphic techniques to help solve geologic problems. The objective will be to provide the participant with an understanding of techniques for creating computer graphics to illustrate geologic information.

Faculty: **Richard C. Craig**, Department of Geology, Kent State University; **Harlan P. Foote**, Battelle Memorial Institute, Pacific Northwest Labs; **Barry L. Roberts**, Department of Geology, Kent State University; and **Michael P. Singer**, URS Dalton, Cleveland. Computer equipment provided courtesy of Hewlett-Packard. Fee includes course manual, lunch both days and dinner Saturday evening. Limit: 24. Fee: \$270.

FOR REGISTRATION INFORMATION CONTACT:

Edna Collis, GSA Course Registrar, GSA Headquarters, P. O. Box 9140, Boulder, Colorado 80301. (303) 447-2020 Fees will be refunded if GSA is notified by October 17. Substitutions may be made at any time. No refunds will be made after the course is completed.

**DIVISION COCKTAIL PARTY, 1986 ANNUAL MEETING, SAN ANTONIO, TEXAS**



Follow the crowd to the Third Annual Q&G Division Cocktail party to be held Tuesday, November 11, 1986, from 7:30-10:30 p.m. at the Hyatt Regency East No. 2. At least one surprise is planned for this event, so plan to arrive early and share in the fun. The first annual event at Reno was a huge success and that at San Antonio is expected to be the same.

**ROCKY MOUNTAIN CELL, FRIENDS OF THE PLEISTOCENE  
FIELD TRIP, SEPTEMBER 6-8, 1986  
GEOMORPHIC EVOLUTION OF THE YELLOWSTONE REGION**

The 1986 Rocky Mountain FOP field trip will be held in the northern part of Yellowstone Park and vicinity. This area is among the most geomorphically active in the Rockies, with exceptional volcanic, glacial, fluvial, and tectonic features dating from the distant past, the recent past, and perhaps the near future!

The trip will begin in Bozeman, Montana, on Saturday, September 6, and follow the Yellowstone River Valley to Yellowstone Park and Lake. Discussions enroute will include the glacial, glaciofluvial, and tectonic history of the lower Yellowstone (Paradise) Valley and the deglacial history and ice extent in the northern portion of Yellowstone Park. The second day will include examination of the stratigraphy at Canyon, including interbedded tills and volcanics, and discussion of the evidence for recent rapid volcanotectonic deformation within the caldera. The second night will also be spent at Yellowstone Lake. On Monday, September 8, participants will return to Bozeman via West Yellowstone, with a look at the evidence for pre-Pinedale glaciation of the Yellowstone Plateau and West Yellowstone basin, at the sequence of scarp evolution in gravels, and at the geomorphology of the upper Gallatin River Valley. Trip participants will include Wayne Hamilton, NPS; Steve Personius, Ken Pierce, and Gerry Richmond, USGS; Bill Locke, Grant Meyer, and John Montagne, Montana State University; and Dave Nash, University of Cincinnati.

For registration information, contact Ken Pierce, USGS, Box 25046, MS 913, Denver, CO 80225.

The first circular will be sent out toward the end of 1986 and Dieter writes "please inform your colleagues of our plans, please let us know if you have propositions to make, and please help us to make the Frankfurt Conference as successful for geomorphology as the Manchester Conference."

3. The World Directory of Geomorphologists. One of the charges issued to the Working Committee during the Plenary Session in Manchester was the eventual publication of a Directory of the World's Geomorphologists. If you are interested in being listed in this Directory, please complete the form below and send it to H. J. Walker, Department of Geography, Louisiana State University, Baton Rouge, LA 70803.

**WORLD DIRECTORY OF GEOMORPHOLOGISTS**

Family Name: \_\_\_\_\_ Telephone No. \_\_\_\_\_  
 Given Names: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 Research Interest: \_\_\_\_\_  
 \_\_\_\_\_  
 Technique Interest: \_\_\_\_\_  
 \_\_\_\_\_  
 Area/Region Interest: \_\_\_\_\_  
 \_\_\_\_\_

H. J. Walker  
Louisiana State University

**INTERNATIONAL GEOMORPHOLOGY: UPDATE**

Since the last QG&G Division Newsletter, there have been three major developments of relevance to international geomorphology: (1) The distribution of the first International Geomorphology Newsletter, (2) the preparation of the first information about the Second International Conference on Geomorphology, and (3) the initiation of a questionnaire for the establishment of a World Directory of Geomorphologists.

1. The International Geomorphology Newsletter. The first newsletter, issued in March 1986, includes the minutes of the three international geomorphology business meetings (the National Delegates meeting, the Plenary Business meeting, and the first Working Committee meeting) held during the FICOG in Manchester, David Sugden's report on his survey of the ramifications involved in the formation of an international geomorphological organization and lists of the members of the working committee, advisory associates, and corresponding members. The second Newsletter will be distributed this Fall.

2. Second International Conference on Geomorphology. The following information has been supplied about SICOG by Prof. Dr. Dietrich Barsch, Geographisches Institut, Universität Heidelberg, Im Neuenheimer Feld 348, D-6900 Heidelberg, West Germany, who is Chairman of the Organizing Committee. The main session of the Second Conference, which is entitled Geomorphology and Ecology, will be held in Frankfurt/Main between Sunday, September 3, 1989, and Saturday, September 9. Pre- and post-congress activities (field trips, workshops, symposia, etc.) are already being planned partly together with neighboring countries. Other members of the Organizing Committee are: Professors Doctors Arno Semmel (local organizer), Frank Ahnert (commemorative publication), Hanna Bremer (proceedings), Detlef Busche (congress abstracts), Heinz Karrasch (finances), Otmar Seuffert (excursions), Gerhard Stäblein (lecture program).

**NEW BOOK: GLACIATION IN ALASKA--THE GEOLOGIC RECORD**

T. D. Hamilton, K. M. Reed, and R. M. Thorson, eds.,  
1986: The Alaska Geological Society, Anchorage,  
Alaska, 265 p. \$18.00 (U.S.)

This volume is a compilation of recent studies of late Tertiary and Quaternary glaciation in ten mountainous regions across Alaska. The individual papers illustrate the broad range of research techniques required for an area as large and diverse as Alaska, with its striking contrasts in climate, vegetation, tectonic history, and accessibility.

Each regional synthesis, written by one or more specialists, reviews earlier studies, describes recent developments, and presents a comprehensive account of glacial stratigraphy and chronology. Most papers include complete bibliographies, correlation charts, maps of glacial limits, and tables of radiocarbon dates that were prepared especially for this volume. The glacial records provide the stratigraphic framework upon which other studies, such as fault activity, volcanism, formation of placer deposits, early human prehistory, and the paleoecology of Beringia, can be based.

**Contents**

**Introduction and overview:** T. D. Hamilton, K. M. Reed, and R. M. Thorson  
**Late Cenozoic glaciation of the central Brooks Range:** T. D. Hamilton  
**Glacial history of the Seward Peninsula:** D. S. Kaufman and D. M. Hopkins

**Glacial geology of the Yukon-Tanana Upland:** F. R. Weber  
**Late Cenozoic glaciation of the northern Nenana River valley:** R. M. Thorson  
**Two glacial records from west-central Alaska:** J. T. Kline and T. K. Bundtzen  
**Glaciation of the Alaska Peninsula:** R. L. Detterman  
**Glacial geology of the Aleutian Islands:** R. F. Black, R. M. Thorson, and T. D. Hamilton  
**Pleistocene glaciation of the upper Cook Inlet basin:** H. R. Schmoll and L. A. Yehle  
**Glacial history of the northeastern Gulf of Alaska:** B. F. Molnia  
**Wisconsin and Holocene glaciation of southeast Alaska:** D. H. Mann

Available from Alaska Geological Society, Attention: Barbara Bascle, Box 101288, Anchorage AK 99510

**NEW BOOK: QUATERNARY EVOLUTION OF THE GREAT LAKES**

P. F. Karrow and P. E. Calkin, eds., 1985: Geological Association of Canada Special Paper 30, 258 p.

**CONTENTS**

**GENERAL**

Glacial Lake Agassiz and Its Influence on the Great Lakes: J. T. Teller

**LAKE SUPERIOR BASIN**

Late Wisconsinan and Holocene History of the Lake Superior Basin: W. R. Farrand and C. W. Drexler  
 Deglacial Great Lakes Shorelines at Sault Ste. Marie, Ontario: W. R. Cowan

**LAKE MICHIGAN BASIN**

Late Wisconsinan and Holocene History of the Lake Michigan Basin: A. K. Hansel, D. M. Mickelson, A. F. Schneider, and C. E. Larsen  
 Lake Milwaukee: An "Early" Proglacial Lake in the Lake Michigan Basin: A. F. Schneider and E. A. Need  
 Lake Level, Uplift, and Outlet Incision, the Nipissing and Algoma Great Lakes: C. E. Larsen

**LAKE HURON BASIN**

Huron Basin Glacial Lakes: A Review  
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 Late Quaternary Molluscan Faunal Changes in the Huron Basin: B. B. Miller, P. F. Karrow, and G. L. Mackie  
 History of Glacial Lake Algonquin in the Haliburton Region, South-Central Ontario: C. A. Kaszicki  
 Glacial Lake Algonquin and the Fenelon Falls Outlet  
 P. F. Finamore  
 Postglacial History of the Minesing Basin, Ontario  
 W. D. Fitzgerald  
 Postglacial Lake Levels in the Huron Basin:  
 Comparative Uplift Histories of Basins and Sills in a Rebounding Glacial Marginal Depression (Abstract)  
 C. F. M. Lewis and T. W. Anderson

**LAKE ERIE BASIN**

Evolution of the Erie-Basin Great Lakes  
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 Chronology and Nature of the Pleistocene Beaches and Wave-Cut Cliffs and Terraces, Northeastern Ohio  
 S. M. Totten  
 Glacial Retreat and Lake Levels, North-Central Lake Erie Basin, Ontario: P. J. Barnett  
 Postglacial Lake Levels in the Erie Basin  
 J. P. Coakley and C. F. M. Lewis

**LAKE ONTARIO BASIN**

Glacial Lakes in the Ontario Basin  
 E. H. Muller and V. K. Prest  
 Postglacial Water-Level History of the Lake Ontario Basin: T. W. Anderson and C. F. M. Lewis

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**MEETINGS**

**Archaeological Geology: Environmental Siting and Material Usage**, December 7-12, 1986, Saint Simons Island, Georgia. Information: Charles J. Vitaliano, Dept. Geology, Indiana University, 1005 East Tenth Street, Bloomington, IN 47405; (812) 335-1407.

**The Fifth International Conference on Permafrost**, June 1988, Trondheim, Norway. Theme: Cold regions science and engineering.

**Sinkholes and the Environmental Impacts of Karst--2nd Multidisciplinary Conference**, February 9-11, 1987, Orlando, Florida. Information: Barry F. Beck, College of Engineering, University of Central Florida, Orlando, FL 32816. (Abstracts due August 15, 1986.)

**Coastal Sediments '87**, May 12-14, 1987, New Orleans, Louisiana. Information: Nicholas C. Kraus, USAE Waterways Experiment Station, Coastal Engineering Research Center, P. O. Box 631, Attn. WESCR-P, Vicksburg, MS 39180-0631.

**International Symposium on Erosion and Sedimentation in the Pacific Rim**, August 3-7, 1987, Corvallis, Oregon. Information: 1987 Corvallis Symposium, Conference Coordinator, College of Forestry, Oregon State University, Corvallis, OR 97331; (503) 754-2004.

**18th Annual Geomorphology Symposium on Catastrophic Flooding**, September 25-27, 1987, Oxford, Ohio. Information: Larry Mayer, Dept. of Geology, Miami University, Oxford, OH 45056; (513) 529-3218.

**RECIPIENTS OF THE KIRK BRYAN AWARD**

1958 Luna B. Leopold and Thomas J. Maddock, Jr. (U.S. Geological Survey)  
The hydraulic geometry of stream channels and some physiographic implications: U.S. Geological Survey Professional Paper 252, 57 p., 1953.

1959 Jack L. Hough (University of Illinois)  
Geology of the Great Lakes: University of Illinois Press, 313 p., 1958.

1960 John F. Nye (University of Bristol)  
The distribution of stress and velocity in glaciers and ice sheets: Royal Society Academy, Proceedings A, v. 239, p. 113-133, 1957.

1961 John T. Hack (U.S. Geological Survey)  
Studies of longitudinal stream profiles in Virginia and Maryland: U.S. Geological Survey Professional Paper 294B, 97 p., 1957.

1962 Anders Rapp (University of Uppsala)  
Recent development of mountain slopes in Karkevagge and surroundings, northern Scandinavia: Geografiska Annaler, v. 42, p. 71-200, 1960.

1963 Arther H. Lachenbruch (U.S. Geological Survey)  
Mechanics of thermal contraction cracks and ice-wedge polygons in permafrost: Geological Society of America Special Paper 70, 69 p., 1962.

- 1964 Robert P. Sharp (California Institute of Technology)  
Wind ripples: Journal of Geology, v. 71, p. 617-636, 1963.
- 1965 Gerald M. Richmond (U.S. Geological Survey)  
Quaternary stratigraphy of the La Sal Mountains, Utah: U.S. Geological Survey Professional Paper 324, 135 p., 1962.
- 1966 Charles S. Denny (U.S. Geological Survey)  
Alluvial fans in the Death Valley region: U.S. Geological Survey Professional Paper 466, 62 p., 1965.
- 1967 Clyde A. Wahrhaftig (University of California at Berkeley)  
Stepped topography of the southern Sierra Nevada, California: Geological Society of America Bulletin, v. 76, p. 1165-1190, 1965.
- 1968 David M. Hopkins (U.S. Geological Survey)  
Quaternary marine transgressions in Alaska, in The Bering Land Bridge: Stanford University Press, p. 47-90, 1967.
- 1969 Ronald L. Shreve (University of California-Los Angeles)  
The Blackhawk landslide: Geological Society of America Special Paper 108, 47 p., 1968.
- 1970 Harold E. Malde (U.S. Geological Survey)  
The catastrophic late Pleistocene Bonneville flood in the Snake River Plain, Idaho: U.S. Geological Survey Professional Paper 596, 52 p., 1968.
- 1971 A. Lincoln Washburn (University of Washington)  
Instrumental observations of mass wasting in the Mesters Vig district, northeast Greenland: Medd. Gronland, bd. 166, nr. 4, 1967; and Weathering, frost action, and patterned ground in the Mesters Vig district, northeast Greenland: Med. Gronland, bd. 166, nr. 4, 1969.
- 1972 Dwight R. Crandell (U.S. Geological Survey)  
Postglacial lahars from Mount Rainier volcano, Washington: U.S. Geological Survey Professional Paper 677, 75 p., 1971.
- 1973 John T. Andrews (University of Colorado)  
A geomorphological study of post-glacial uplift: London, Institute of British Geographers, Special Publication No. 2, 156 p., 1970.
- 1974 Robert V. Ruhe (Indiana University)  
Quaternary landscapes in Iowa: Iowa State University Press, 255 p., 1969.
- 1975 James B. Benedict (Colorado State University)  
Downslope soil movement in a Colorado alpine region--rates, processes and climatic significance: Arctic and Alpine Research, v. 2, p. 165-226, 1970.
- 1976 Geoffrey S. Boulton (University of East Anglia)  
Processes and patterns of glacial erosion: Binghamton, State University of New York, Geomorphology Symposium, 5th, Proceedings, 1974.
- 1977 Michael A. Church (University of British Columbia)  
Baffin Island sandurs: A study of Arctic fluvial processes: Geological Survey of Canada Bulletin 216, 208 p., 1972.
- 1978 Richard L. Hay (University of California at Berkeley)  
Geology of the Olduvai Gorge--a study of sedimentation in a semiarid basin: Berkeley, University of California Press, 1976.
- 1979 Stanley A. Schumm (Colorado State University)  
The Fluvial System: New York, John Wiley and Sons, 338 p., 1977.
- 1980 James A. Clark, William E. Farrell, W. Richard Peltier  
Global changes in postglacial sea level--A numerical calculation: Quaternary Research, v. 9, p. 265-287, 1978.
- 1981 J. Ross Mackay (University of British Columbia)  
Pingos of the Tuktoyaktuk Peninsula area, Northwest Territories: Geographie Physique et Quaternaire, v. 33, no. 1, p. 3-61, 1979.
- 1982 Kenneth L. Pierce (U.S. Geological Survey)  
History and dynamics of glaciation in the northern Yellowstone Park area: U.S. Geological Survey Professional Paper 729-F, 90 p., 1979.
- 1983 Leland H. Gile, John W. Hawley, Robert B. Grossman  
Soils and Geomorphology in the Basin and Range Area of Southern New Mexico--Guidebook to the Desert Project: New Mexico Bureau of Mines and Mineral Resources Memoir 39, 222 p., 1981.
- 1984 Steven M. Colman (U.S. Geological Survey)  
Chemical weathering of basalts and andesites--Evidence from weathering rinds: U.S. Geological Survey Professional Paper 1246, 51 p., 1982.
- 1985 No award given.
- 1986 Ronald I. Dorn and Theodore M. Oberlander  
Rock varnish: Progress in Physical Geography, v. 6, no. 3, p. 317-367, 1982.

#### DIVISION CHAIRMEN

1986 G. M. Ashley	1975 R. L. Nichols	1964 A. L. Washburn
1985 D. F. Eschman	1974 D. R. Crandell	1963 L. B. Leopold
1984 D. J. Easterbrook	1973 H. E. Malde	1962 J. G. Fyles
1983 J. T. Andrews	1972 R. F. Flint	1961 J. T. Hack
1982 T. L. Pewe	1971 R. P. Goldthwait	1960 C. S. Denny
1981 M. Morisawa	1970 D. M. Hopkins	1959 G. W. White
1980 S. A. Schumm	1969 A. D. Howard	1958 G. W. White
1979 W. B. Bull	1968 W. D. Thornbury	1957 J. H. Mackin
1978 A. L. Bloom	1967 H. E. Wright, Jr.	1956 J. H. Mackin
1977 W. C. Bradley	1966 R. F. Black	1955 E. Blackwelder
1976 L. H. Lattman	1965 G. M. Richmond	

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1981- R. F. Madole	1967-1970 S. E. White	1957-1960 H. E. Wright, Jr.
1971-1981 D. J. Easterbrook	1961-1966 L. H. Nobles	1955-1956 R. P. Goldthwait

#### PAST PANELS

<b>1957-59</b>	<b>1959-61</b>	<b>1961-62</b>	<b>1962-63</b>	<b>1963-64</b>
S. Judson	L. B. Leopold	R. F. Black	E. H. Muller	W. C. Bradley
J. C. Frye	J. P. Miller	R. P. Goldthwait	R. R. Shaffer	D. R. Crandell
W. D. Thornbury	G. M. Richmond	H. E. Wright, Jr.	C. A. Wahrhaftig	D. F. Eschman
J. T. Hack	R. P. Sharp	C. S. Denny	R. F. Black	E. H. Muller
A. N. Strahler	M. G. Wolman	R. L. Nichols	R. P. Goldthwait	P. R. Shaffer
A. D. Howard	J. M. Zumberge	A. N. Strahler	H. E. Wright, Jr.	C. A. Wahrhaftig

**1964-65**

S. A. Schumm  
 A. N. Strahler  
 S. E. White  
 \*W. C. Bradley  
 J. H. Mackin  
 D. R. Crandell  
 D. F. Eschman

**1965-66**

A. L. Bloom  
 J. T. Hack  
 C. A. Wahrhaftig  
 S. A. Schumm  
 A. N. Strahler  
 S. E. Whiter

**1966-67**

W. C. Bradley  
 D. F. Eschman  
 E. H. Muller  
 A. L. Bloom  
 J. T. Hack  
 C. A. Wahrhaftig

**1967-68**

J. H. Hartshorn  
 T. L. Pewe  
 M. G. Wolman  
 W. C. Bradley  
 D. F. Eschman  
 E. H. Muller

**1968-69**

D. R. Crandell  
 S. C. Porter  
 A. L. Washburn  
 J. H. Hartshorn  
 T. L. Pewe  
 M. G. Wolman

**1969-70 (Jan.)**

W. C. Bradley  
 A. L. Bloom  
 R. L. Shreve  
 D. R. Crandell  
 S. C. Porter  
 A. L. Washburn

**1969-70 (Nov.)**

P. W. Birkeland  
 H. W. Borns, Jr.  
 D. J. Easterbrook  
 W. C. Bradley  
 A. L. Bloom  
 R. L. Shreve

**1970-71**

P. W. Birkeland  
 H. W. Borns, Jr.  
 \*D. J. Easterbrook  
 M. Morisawa  
 J. H. Hartshorn  
 R. V. Ruhe  
 S. E. White

**1971-72**

J. H. Hartshorn  
 R. V. Ruhe  
 S. E. White  
 R. R. Curry  
 R. J. Janda  
 S. C. Porter

**1972-73**

P. W. Birkeland  
 L. Clayton  
 M. Morisawa  
 R. R. Curry  
 R. J. Janda  
 S. C. Porter

**1973-74**

J. T. Andrews  
 W. B. Bull  
 J. H. Hartshorn  
 P. B. Birkeland  
 L. Clayton  
 M. Morisawa

**1974-75**

J. T. Andrews  
 W. B. Bull  
 J. H. Hartshorn  
 W. H. Johnson  
 K. L. Pierce  
 J. W. Hawley

**1975-76**

W. H. Johnson  
 K. L. Pierce  
 J. W. Hawley  
 P. W. Birkeland  
 E. H. Muller  
 S. C. Porter

**1976-77**

P. W. Birkeland  
 E. H. Muller  
 S. C. Porter  
 J. T. Andrews  
 V. R. Baker  
 M. Morisawa

**1977-78**

J. T. Andrews  
 V. R. Baker  
 M. Morisawa  
 J. B. Benedict  
 W. R. Farrand  
 S. E. White

**1980-81**

G. M. Ashley  
 R. P. Goldthwait  
 R. J. Janda  
 E. B. Evenson  
 A. F. Schneider  
 G. I. Smith

**1981-82**

E. B. Evenson  
 A. F. Schneider  
 G. I. Smith  
 R. F. Black  
 J. H. Hartshorn  
 N. W. Rutter

**1982-83**

R. F. Black  
 T. H. Hamilton  
 J. H. Hartshorn  
 R. C. Palmquist  
 D. F. Ritter  
 N. W. Rutter

**1978-79**

J. B. Benedict  
 W. R. Farrand  
 S. E. White  
 J. E. Armstrong  
 P. W. Birkeland  
 K. L. Pierce

**1979-80**

J. E. Armstrong  
 P. W. Birkeland  
 K. L. Pierce  
 G. M. Ashley  
 R. P. Goldthwait  
 R. J. Janda

**1983-84**

J. L. Forsyth  
 T. D. Hamilton  
 D. M. Mickelson  
 R. C. Palmquist  
 D. F. Ritter  
 S. G. Wells

**1984-85**

S. M. Colman  
 J. E. Costa  
 J. L. Forsyth  
 M. J. Guccione  
 D. M. Mickelson  
 S. G. Wells

**1985-86**

S. M. Colman  
 J. E. Costa  
 R. J. Fulton  
 M. J. Guccione  
 T. C. Gustavson  
 L. J. Maher, Jr.

\*resigned to accept office



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