GSA news & information

SUPPLEMENT TO GEOLOGY MAGAZINE

JULY 1976

Two new reports from the Committee on Environment and Public Policy are available

Geologic Constraints in the Urban Environment. *Prepared by a panel under the chairmanship of Wallace R. Hansen that included Donald R. Coates, James R. Dunn, I. Beach Leighton, Andrew M. Spieker, Robert E. Wallace, and Stanley D. Wilson.*

The 12-page report contains discussions under the following topics: *Water, Solid Waste, Building Foundations, Landslides, Construction Materials, Earthquake Hazards, Geologic Constraints and Open Space,* and *Ultimate Responsibility of the Community.* As pointed out in the Foreword, the report is designed as an information paper for decision makers in the broad field of land use.

Impact of Barrier-Island Development—Geologic Problems and Practical Solutions. *Prepared by a panel under the chairmanship of Robert A. Morton that included Cyril J. Galvin, Jr., James D. Howard, Joe C. Moseley, Orrin H. Pilkey, Limberios Vallianos, and James A. Veltman.*

The 8-page report contains, in addition to an introductory discussion, sections titled: *Beach and Barrier-Island Dynamics, Important Environmental Considerations, Other Constraints, Impact of Human Activities,* and *Alternatives to Coastal Problems.* The focus of this information paper is on the coastal areas of the Gulf of Mexico and the Atlantic Ocean.

Members of GSA may secure copies free of charge of either or both of these reports by writing to headquarters and requesting copies; or, if you prefer, you may check the special box in the order blank for *Bulletin* separates near the end of the News & Information section.

The membership of the Committee on Environment and Public Policy is as follows: John H. Moss, Chairman; Helen L. Cannon; George B. Maxey; John D. Moody; Peter H. Given; Howard R. Waldron; M. Genevieve Atwood; Donald D. Runnells; Nathaniel Rutter; and Harold E. Malde, Conferee.

GSA representative to AAAS, Section W reports meeting

AAAS met in Boston, Massachusetts, February 18–24, 1976. Section W (Atmospheric and Hydrospheric Sciences) sponsored, or co-sponsored, seven symposia. (Since principal GSA reference to AAAS Section W is the Hydrogeology Division, only the hydrological aspects of Section W activities are discussed.)

Only one of seven symposia dealt with hydrology, and the make-up of the "Progress in the Hydrospheric Sciences" was such that the description of progress in the ground-water and hydrogeological disciplines was minimal. (Unfortunately, this symposium was held on February 18, and I was unable to come to the meeting until February 19. Attendance was reported to be small, but the papers were said to be informative.)

Water was discussed in the context of six other symposia and could have been a major subtopic in several others.

The officers of Section W, and their affiliations and specialties, for the coming year (1976) are:

- Chairman, Fred D. White, NSF (Atmospheric Physics)
- Chairman-elect, Robert Fleagle, University of Washington (Atmospheric Science and Oceanography)
- Secretary, Stanley A. Chongnon, Jr., Illinois State Water Survey (Hydrologist)

Section W, like six other sections, had no business meetings. Consequently, it was impossible to make any formal representations regarding GSA's effort to upgrade its level of interest in Section W activities. Informally, members of the Section, mostly atmospheric types, welcomed increased contact with GSA. However, what this means in terms of liaison, I do not yet know.

Two possible areas of joint GSA–AAAS interest are matters of scientific responsibility, profession and practice, and matters of interdisciplinary and interprofessional cooperation and interaction.

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Penrose Conference Guidelines

PURPOSE

The Penrose Conferences were established by the Geological Society of America in 1969 as a further step in its promotion of the science of geology. A geological counterpart of the Gordon Conferences in the field of chemistry, the Penrose Conferences provide members and other interested Earth scientists the setting and opportunity for exchange of information and ideas. Informal discussions pertaining to the science of geology and related fields are intended to stimulate individual research and to advance the science by the interchange and development of new ideas. The participants will not be looking for conclusions to settle arguments but instead will provide stimulus and excitement in a field, so that ideas aired, associations made, and doubts raised may aid in future research.

These interdisciplinary conferences are international in scope, and participants include promising students who have special interest in the subject matter.

SUBJECT/TOPIC

Ideal topics for conferences are those in which recent work suggests further significant advances in the near future. Each conference subject should be currently under active discussion and investigation by research either in the field or in the laboratory. Topics should be broad enough so that a range of specialists can discuss them from several points of view, but not so broad that a lack of communication can develop. Beyond this, there is no limit upon the choice of subject, except that it must relate to the Earth sciences.

CONVENOR

A convenor must be thoroughly familiar with the current activities in the specialized fields that are to be the subject of a conference. In order to foster communication and stimulate research among experts in diverse but related fields, responsibility for organizing a conference normally should be shared by two or more convenors, each of whom can draw upon his own experience and expertise in developing a well-integrated, effective conference program.

Co-convenors provide the necessary back-up for continuing a conference should one convenor be unable to participate after plans have been completed. Having co-convenors is important in the planning of a conference that involves more than one field of specialization. There are also advantages in dividing the work load during the planning and the presenting of a conference.

SIZE/TIME

The informal character of the conferences is regarded as essential; involvement by all individuals is desirable. Groups should not be so large that personal discussion between all participants is impossible nor so small that individual viewpoints are soon established and discussion worn thin. The recommended size of a conference is between 55 and 60 participants. The maximum allowable number is 70; the minimum number to convene a conference is 35.

Limitations on size are not intended to contribute to the development of any "closed groups" but are imposed only to ensure the effectiveness of the conferences.

The desirable length of a conference is five days, although shorter or longer conferences may be warranted under special circumstances. These should be fully explained in the conference proposal. Because participants are expected to attend the entire conference, a block of time longer than five days extracted from participants' schedules to attend a conference is often impractical or impossible.

A period of approximately nine to twelve months between the date of approval by the Penrose Conference Committee and the date of the conference is normally required. In no case should there be less than six months from the time of conference announcement in GSA News & Information and *Geotimes* and the conference dates.

Care should be taken to avoid scheduling conferences at the same time as other scientific meetings, especially other GSA section and committee meetings. Convenors should check the calendar of events in *Geotimes* or call the Coordinator to confirm dates.

LOCATION

There are no restrictions about holding a conference anywhere in the world, though logistics, cost, and other problems dictate caution in organizing conferences outside of North America.

Essential qualities of a good site are that it be removed from the distraction of other meetings and other demands on the time of the participants. The site should offer adequate meeting facilities and comfortable surroundings where participants can live, eat, work, and relax together. Climate, accessibility, meals, sleeping accommodations, recreational facilities, and economy should all be considered in selecting a site.

If a field trip is included in a proposal, choice of a conference site will be limited.

Convenors may suggest specific sites or may indicate to the Coordinator which geographical area would be most suitable for a conference. Final selection of the site must be made by the Coordinator with the approval of the Penrose Conference Committee.

PARTICIPATION

Anyone interested in attending a specific conference is encouraged to contact the convenor of that conference. Participation will not be restricted to members of the Geological Society of America; however, GSA members will receive preference when there is a choice between equally qualified persons. The final decision on participation will be made by the convenor, whose decision shall be final and not subject to appeal. Acceptances for participation are not transferable.

All conferences will be announced in GSA News & Information, *Geotimes* calendar, and in other Earth science journals, newsletters, and so forth.

Participation by graduate students should be encouraged by providing incentives such as reduced registration fees. Promising students should compose as much as 10 percent of the total conference registration.

All participants are expected to live at the conference site. Spouses, families, and guests are NOT welcome, as the purpose of the conference is better served by limiting distractions and encouraging full participation at all times, whether in sessions, during free periods, at meals, or during late informal gatherings.

Participants are expected to attend the entire conference; all must pay the conference fee. Some exceptions to the latter are made in the case of international guests if funding for them is obtained from outside sources.

SPONSORSHIP

The Geological Society of America is the principal sponsor of the Penrose Conferences; however, the Society welcomes other societies, organizations, and institutions as co-sponsors. Convenors must identify sponsors in their proposals, and the Penrose Conference Committee reserves the right to approve co-sponsors at the time the proposals are being considered. Recognition will be given to co-sponsors in the conference announcements, as well as during the conference.

Co-sponsors must agree to abide by the guidelines and to cooperate with the Coordinator and other GSA staff members.

FINANCING

Each conference must be self-supporting, with financial management provided by the Coordinator. Each convenor is expected to confer with the Coordinator, who will develop a conference budget based on costs. From this budget, a registration fee will be established that will cover all costs, such as food, lodging, local transportation, field trips, and miscellaneous expenses.

Administrative and other expenses incurred by GSA in support of the conferences are offset by a surcharge of $35 per paying participant. This surcharge is included in the registration fee. Direct travel costs for the Coordinator and the convenors are also chargeable to the conference.

To confirm guarantees for food and lodging, all registration fees must be sent in advance to the Coordinator.

At the conclusion of the conference, a financial report will be prepared by the GSA staff for the convenor, the Penrose Conference Committee, and the GSA Council.

INITIATION OF A PENROSE CONFERENCE PROPOSAL

Any member of the Geological Society of America interested in convening a Penrose Conference may submit a proposal. Each proposal must contain the following:

1. A short expression of the subject, by title.
2. A short outline of the subject in about 250 words.
3. A short statement explaining how a conference on this subject will meet the objectives that have been established for the Penrose Conferences.
4. An initial list of suggested key speakers and the topics they will discuss.
5. A tentative outline of sessions.
6. A suggested geographic location.
7. Choice of dates and alternate dates (or at least suggested time of year).
8. Anticipated number of participants; suggested deadline for receiving applications.
9. A description of any field trip that is a suggested part of the conference.
10. A paragraph on any international guests who might be considered and the anticipated financial support for their participation.
11. Biographic data on the convenors, including a list of publications and projects that qualify him or her for leading the proposed conference.
12. A statement indicating the willingness of the convenors to act in accordance with Penrose Conference Guidelines and to cooperate with the Coordinator and other GSA staff members.
13. Identification of co-sponsors, if any.

Proposals should be sent to

Chairman, Penrose Conference Committee
Geological Society of America
c/o Penrose Conference Coordinator
3300 Penrose Place
Boulder, Colorado 80301

The Penrose Conference Committee reviews proposals as they are received. Immediate action is taken on all proposals, and prospective convenors will be contacted by the chairman of the committee.

In accepting a proposal, the Penrose Conference Committee may offer advice, which in some cases may be a condition of acceptance. The committee chairman will address an advisory letter to the convenor calling his attention to any matters that seem likely to pose a problem that the convenor must resolve if the conference is to be successful. The committee expects these recommendations to be followed.

PENROSE CONFERENCE COORDINATOR

The Society has made available to convenors the services of a Penrose Conference Coordinator. She offers assistance to convenors in every area of conference planning. Convenors are urged to rely on her expertise. The Coordinator will assume responsibility for all arrangements with the conference facility concerning prices, meetings and sessions, food, recreation, lodging, transportation, and so forth.

The Coordinator will attend each conference to assist the convenor by freeing him of all logistical arrangements so that he may concentrate on the technical and scientific aspects of the program.

Convenors who have had a proposal approved by the Penrose Conference Committee may obtain from the Coordinator, for use as guides, sample letters and forms, as well as a convenient check list found useful to past convenors.

Each convenor must send a copy of all correspondence to the Coordinator—and vice versa—so that all persons involved with the conference planning are kept informed, and adequate central files can be maintained at headquarters.

The Penrose Conference Committee requires periodic reports from convenors on conference plans as they progress. Details regarding timing and content of these reports are incorporated in the convenor's check list.

PROGRAM

Informative, stimulating, controversial, and even provocative programs provide the key to successful Penrose Conferences. Careful, early planning is a must; convenors, though they may want to name session chairmen to assist with the final program, should have full control over program content.

Convenors should contact key participants very early in the planning of the conference with regard to presentations on specific topics. These individuals should provide the backbone of the program; from this base, and to further enhance the program, additional speakers should be sought from those who volunteer contributions.

Care should be taken not to overstructure the program. It is important to note here that not all participants need to make formal presentations to participate fully in the conference; material can be presented in informal sessions and in discussions as well.

Speakers should be held to their allotted time. Emphasis should be placed on the importance of quality slides and brief but informative and to-the-point presentations.

CONFERENCE REPORTS AND PUBLICITY

The convenor assists the Coordinator in the preparation of the conference announcement that is published in appropriate scientific journals. As soon as the conference is over, the convenor is expected to send a brief formal report to the Executive Director of the Society. The report should include an evaluation of the conference based on the participants' comments and the convenor's experience, as well as suggestions for improvement of the conference as a whole.

At the same time, the convenor should prepare a news report that covers the most interesting scientific and technical facets of the conference for publication in *Geology* or other scientific publications.

The purpose of the report is to inform those not in attendance at the conference of the main trends of thinking and the discussions that took place. The report should not publish specific data or concepts for which individual participants expect to receive priority through publications authored by them in regular journals of their individual choice. In trying to balance the opposing needs to inform and to preserve priority, the convenor has a difficult task, which must be performed with some delicacy.

As an incentive to free exchange of information and to encourage open and frank discussion, no printed proceedings will result from the conferences. It is anticipated that symposia, at GSA annual meetings or elsewhere, may develop from some conferences. These should consist of a series of related formal papers, each reflecting the author's own ideas, rather than a synthesis of what was presented at a particular conference.

The Society hopes and expects that all participants will freely discuss with their colleagues the significant results of their participation. The intent is that the conferences shall be, in effect, seedbeds for the proper nurture of new thinking in all phases of the science of geology.

GUIDELINES

These guidelines, formulated by the Penrose Conference Committee and approved by the GSA Council, provide rules based on experience gained from past conferences; changes and improvements will be incorporated as experience dictates. Once approval has been given by the Society, the convenor will be fully responsible for the conference in accordance with the guidelines, and his acceptance implies agreement to abide by them. In cases of flagrant violation of the guidelines, the Executive Director of the Society is empowered to take appropriate action, including cancellation or postponement of the conference in violation.

Penrose Conferences

Conference on "Gulf of Mexico and Its Bordering Structure" scheduled for February 6-11, 1977

A Penrose Conference on "The Gulf of Mexico and Its Bordering Structure" sponsored by the Geological Society of America and the Consejo Nacional de Ciencia y Tecnologia, Mexico, is scheduled for February 6–11, 1977. Convenors are Dr. Cinna Lomnitz, Universidad Nacional, Instituto de Geofisica, Mexico D.F., Mexico; Dr. William Muehlberger, Department of Geological Sciences, University of Texas, Austin; and Dr. J. L. Worzel, Marine Science Institute, University of Texas, Galveston. The location of the conference will be near Mexico City, but the exact site has not yet been determined.

The origin and evolution of the Gulf of Mexico have been the subject of study and debate between Earth scientists from a broad range of disciplines and with a wide variety of interests. Pre-Cenozoic continental reconstructions fail to account for most of middle America, although a wide variety of models have been proposed.

The purpose of this conference is to assemble a wide spectrum of active workers and to provide the opportunity for dialogue between Earth scientists from different countries and from different academic traditions and backgrounds, who have been working on these and related problems.

Sessions are proposed on geophysics of the Gulf of Mexico; Precambrian and Paleozoic history of the Gulf margins; Mesozoic and Cenozoic evolution of the Gulf and its perimeter; relationships between the Gulf of Mexico, the Caribbean, and the Middle America Trench; and plate tectonic processes and intraplate deformations as related to the Gulf of Mexico.

Registration fee for the conference is expected to be under $300 and will include all food and lodging, transportation from Mexico City to the conference site and return, and all other conference-related costs. Attendance will be limited to 60–70. Application forms can be obtained from Dr. W. R. Muehlberger, Department of Geological Sciences, The University of Texas at Austin, Austin, Texas 78712. (Phone: 512-397-5810.) Deadline for receipt of applications is December 1, 1976.

Conference on "Tibet" scheduled March 21-24, 1977

A GSA Penrose Conference on "Tibet" will be convened by Kevin Burke and Peter Molnar in the southeast United States from March 21 to 24, 1977. The purpose is to present and discuss evidence bearing on the geologic history, structure, and tectonics of Tibet. Evidence of a number of different types will be discussed, concentrating on (1) the surface geology in as much detail as is possible, and what constraints it puts on the timing of uplift and amount of crustal shortening in Tibet; (2) the various seismological and other evidence that bears on the crustal and upper mantle structure beneath Tibet; (3) the evidence for abundant volcanism on the Tibetan plateau, and other geochemical studies of rocks obtained by expeditions there; (4) observations from satellite photography and seismology that bear on the recent and present tectonics; and (5) the geologic history of the surrounding region insofar as its importance for an understanding of Tibet. *This conference will not be a detailed discussion of the Himalayas or other regions of Asia.* An understanding will be sought of such questions as: Why Tibet is so high? Why is the crust thick (if it is)? How much crustal shortening could have occurred within Tibet since the Cretaceous? How the structure and tectonics of Tibet are related to the collision of India with Eurasia? How present-day Tibetan geology can be used as an analog with portions of other ancient orogenic belts in order to understand both better?

The cost of the conference will be about $200, including the registration fee, meals, and lodging. Attendance will be limited to about 35 participants. Those interested should write to: Kevin Burke, Department of Geological Sciences, State University of New York at Albany, Albany, New York 12222; or to Peter Molnar, Room 54-7R, Department of Earth and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139. *State in one paragraph what you wish to contribute to this conference.* Deadline for application is December 31, 1976.

Membership

New Members

The following 223 persons have been elected to Membership by Committee action during the period from September 1, 1975, through March 31, 1976:

Kenneth R. Aalto
Ralph W. Abele, Jr.
James W. Addington, Jr.
Victor E. Aguayo
Roy F. Allen
Carolyn K. Anderson
James L. Anderson
Jean A. Andrews
Richard J. Arculus
Clarence E. Aschbrenner

Daniel J. Bailey
Charles E. Barker
John A. Barker
William L. Basham
Nestor J. Beascoechea
Donald F. Beck
Katherine J. Beinkafner
James B. Benedict
Michael J. Bennett
Philip R. Bjork
Michael A. Bobal, Jr.
Paul K. Bonifaci
Grant L. Boxer
John T. Bursnall

Michael T. Carroll
Frank T. Caruccio
Susan M. Chandler
Harry B. Chase, Jr.
Lokeshwar N. Chaturvedi
Raymond N. Chukwu
Lloyd S. Cluff
James C. Cobb
Gary F. Collins
Lawrence B. Conyers
Herlander A.C. Correia
William M. Corrigan
Harry R. Covington
Joseph S. Cragwall, Jr.
Donald A. Cranor
Edward L. Crisp
William J. Czimer

Reynold T. Decou
John D. Dejournett
Frank E. Denison
Vernon D. Deruyter
Robert J. Dineen
Carl E. Dinerman
Fred A. Dix, Jr.
Soba Djallo
Albert C. Douglas
Kenneth G. Downing

David A.V. Eckhardt
Douglas W. Edsall
Dan C. Edwards
Stephen L. Eittreim
David L. Emmons
Marcia A. Engle
Oscar A. Erdman

Steven S. Field
Richard P. Fink
Robert F. Flory
James A. Fouts
Donald M. Francis

Donald V. Gaffney
S. Peter Galanis, Jr.
John P. Galloway
Charles M. Garvich
Swapan K. Ghosh
Andrew J.W. Gleadow
Fraser E. Goff
Howard J. Gordon
Loren O. Gray
Nicholas P. Greci
Peter L. Guth
Manfred P. Gwinner

Martin A. Halseth
John C. Hamson, Jr.
Thomas B. Hanley
James D. Hansink
Paula L. Hansley
Robert B. Hardy
Edwin M. Hares
W. Brian Harland
Karen A. Harmon
Michael W. Hart
Pembroke J. Hart
Bruce W. Harvey
Hugo H. Hawkins
Charles R. Hemphill
Barry K. Henderson
Donald A. Herron
Gordon R. Hess
Robert L. Hill
Harry E. Hohmann
Allen W. Holmes, Jr.
Mark J. Holtzclaw
Jeff P. Honderich
Timothy P. Hopwood
Dwight T. Hoxie

Jurgen H. Illies
Andrew E. Isherwood

John E. Janbaz
Mary L. Johnson
Michael B. Jones

Karlis Kanbergs
Edward R. Keller
George W. Kendall
Joseph L. Kirschvink
Richard E. Kolsch
Leonard F. Konikow
David P. Korzendorfer
Catherine E. Krause
John T. Kuo
Michael Kupferman

David J. Lachance
Victor R. Lahti
Robert A. Lamarre
Jean F. Lecolle
Robert E. Lehner
Roberto A. Leigh
Joseph P. Leonard
Xavier T. Le Pichon
Christopher J. Lewis
Cinna Lomnitz
Gretchen Luepke
Anne B. Lutz-Garihan

Michael C. Mackiewicz
William B. Mahoney
Florian Maldonado
Richard E. Mann, Jr.
Emily L. Marcantel
Denis E. Marchand
Gregg Marland
C. Carew McFall
James M. McLelland
Terry L. McMillan
Winthrop D. Means
Michael B. Mehrtens
Joe V. Meigs
Arthur J. Mendenhall
Gerald Millar
Michael F. Mills
Raymond L. Morley

Kazuaki Nakamura
Kenneth R. Neuhauser
Robert C. Newton
Renny R. Nichols
Jean-Paul Nicolet
Swie-d in Nio

Arnold L. O'Brien
Hakuyu Okada
Fernando Ortega-Gutierrez
Joanne R. Ouellette

James E. Pearl
Augusto J. Pedreira
Michael E. Perkins
Sunday W. Petters
Gertrude G. Phelps
Thomas H. Philpott
Geoffrey F. Prior
Ronald J. Purviance
Roman Z. Pyrih

Robert F. Raidl
W. Ross Reinwald
Alice A. Repsher
Richard C. Robinson
Emile Rod
Reuven Roded
David M. Rolling
Carlos D. Roman
Mark Rosser
Zsolt F. Rosta
Richard A. Roy
Suzanne J. Russell

Charles P. Sabine
Michael Sarnthein
Timothy J. Schmidt
William J. Schmutte
Jean W. Schroeder
John W. Schutt
William O. Seeley
Lynne M. Settzo
Rohini P. Sharma
Carol M. Shifflett
Howard R. Shifflett
Lawrence B. Shotwell
Ravindra P. Sinha
Martin G. Sirovs
Dorothy M. Skillings
William V. Sliter
Gary D. Slusher
Douglas L. Smith
Jean-Francois M. Stephan
Donald L. Stevens
Steven J. Stokowski, Jr.
Janet R. Stone
Maurice J. Stouse, Jr.
Tsuguo Sunamura
Peter R. Supko
Patricia L. Sutch
Jeffrey C. Sutherland
John Sutton
Ted L. Swearingen

David E. Tabet
Robert B. Tate
Ricky J. Taylor
Roger D.K. Thomas
Victoria R. Todd
Anita R. Trippet
James B. Truman

Page C. Valentine
Mary L. Vanderloop
Jean L. Vigneresse

William T. Watson
Paul C. Weidig
Pamela H. Wetlaufer
Roy E. Williams
Bruce D. Wilson
Francis L. Witkege
Claudia A. Wolfbauer
Warren W. Wood
Richard F. Wright

Neil H. Zickefoose

New Fellows

The following 29 Members were elected to Fellowship by the Council at its spring meeting, May 4, 1976:

Jean A. Aubouin

Victor R. Baker
Burke Burkart

Henry A.K. Charlesworth
James B. Coffman
Edward Cotter

Robert L. Fuchs

J. C. Harksen
John D. Harper
Miles O. Hayes
Ellen M. Herron
Johnston E. Holzman
Julia A.E.B. Hubbard

Paul D. Komar
Wolfgang Krebs

Paulo M.B. Landim
Paul D. Lowman, Jr.

Richard L. Mauger
Peter H. Molnar
L. Cameron Mosher
Philip M. Orville
Galip Otkun

Sam Rosenblum

Denis M. Shaw

Jorn Thiede

Grant M. Valentine
Peter R. Vogt

David E. Willis

Isidore Zietz

New Student Associates

Listed below are 314 Student Associates who have become affiliated with the Society during the period from September 1, 1975, through March 31, 1976:

Linda B. Alexander
Richardson B. Allen
David E. Andrews
Malcolm P. Annis
James C. Ashleman

L. Joseph Bachman
Arthur P. Baclawski
Robert L. Badger
Terry P. Bailey
George A. Ballard
Randall J. Bargelt
Rodney A. Barlow
John C. Barone
Charles E. Bartberger
John E. Battie
David A. Bedsun
Ilene E. Belvin
Philip A. Benes
Kim R.W. Bennetts
Richard G. Berggreen
Steven C. Bergman
Dale E. Bergquist
Debbie M. Bliefnick
Pamela Bloss
Paul W. Bobowiec
Donald G. Bolin
Jeremy L. Boak
Michel Bouchard
Linda G. Bowman
Michael T. Brady
Blair P. Bremberg
James C. Brenneke
Gary W. Brierley
John B. Bristow
Charles A. Brott
Alton A. Brown
Amalie J. Brown
Neil A. Brown
Alexis A. Budai
Stephen L. Burch
Grace Y. Burke
Steven E. Bushnell
Paul R. Butler

Alfonso E. Calderon-C.
Dennis R. Campbell
Frank W. Campbell
Rodney T. Cape
Katharine V. Cashman
Mark E. Cavaleri
Stephen D. Champlin
Val W. Chandler
Thomas C. Chidsey, Jr.
Scott C. Christenson
Karl Ciak
Curtis R. Cohen
Garth P. Colwell
Susan M. Cook
Gail E. Cordy

Diane Cossack
James D. Crabtree
Larry S. Crumpler
W. E. Curtis

Klaus W. Damm
James M. Davis
Thomas L. Davis
Chadwick C. Deaton
James M. Demarest
Jack W. Demorra, II
W. Thomas Deubel
Donna J. Distabile
Joseph F. Donoghue
Robert L. Doty
Paul E. Drez
Douglas W. Duncan
Barbara L. Dutrow

Larry W. Eason
Lina M. Echeverria
Duncan L. Edwards
Lucy E. Edwards
David E. Ellis
Karen M. Elmeier
Ruth Engel

Patrick L. Fahey
Ronald B. Farmer
William C. Feirn
Kim W. Ferrall
David S. Filar
Robert H. Filson
Lawrence J. Flynn
Philip M. Fontana
Terry N. Fralick
David Frank
Daniel A. Freiberg
Bruce W. Furst

Gary L. Galloway
Wilford D. Gardner
James R. Garrison, Jr.
Joe D. Giddens, III
Virginia S. Gillerman
Charles W. Gillespie
Beverly J. Giza
Elaine H. Goldstein
Frances Gombos
Wendy A. Gordon
Rhea L. Graham
Jeffrey A. Grambling
Teresa W. Greer
Jeffrey C. Griesemer
Mark L. Griswold

Joseph W. Hakkinen
William B. Hansen
William L. Harmon
Suchit S. Hart

Fred F. Hawkins
Martha A. Hayes
Rick T. Hildebrand
Harold D. Hilton
Michael K. Himes
Robert B. Hiseler
Wade A. Hodges
Stephen A. Hoffman
John D. Hoholick
Douglas W. Hollett
James W. Holmes
Norman E. Hopp
Lawrence J. Horan
Catherine A. Horsey
James J. Howard
William P. Hudson
Mohammad A. Husain
Jonathan M. Husch
Linda J. Hutchins
Amy Hutsinpiller

Marie D. Jackson
Joseph G. Jacquot
William R. Jamison
Robert E. Jenkins, II
Brenda M.H. Jogan
Steven A. Joliat
Brian K. Jones
Terry D. Jones

Lisa R. Kanter
Robert W. Karlewicz
Crystal L. Kemter
Christopher Kenah
Keith M. King
Kandy G. Kisser
George A. Klouda
Richard D. Knowling
Debra M. Knox
Peter L. Knuepfer
Charles A. Koeninger
Thomas J.Z. Konecki
Jonathan L. Konkler
Deborah F. Kosich
Ann M. Kramer
Peter V. Kranak
Daniel W. Kraus

David R. Lageson
William R. Lambert
Robert T. Langan
Richard K. Larsen
Jay L. Lazarus
Florian K. Lehner
Gregg M. Lemasters
Mary E. Lennon
Raymond A. Levey
Richard W. Lewis
Henry M. Lieberman
James J. Lienkaemper, II

Samuel H. Limerick
Robert F. Lindsay
Thomas E. Lisle
Richard C. Lorson
Robert M. Lowy
Iris A. Luth

Randall S. Maass
Thomas K. Mahan
Kathleen P. Makgill
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Oluseye O. Yerokun

Garrett E. Zabel
Bruno Zutelija

AAAS representative report . . .

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Because AAAS is prestigious and because it is attended by scientists working in many fields, it provides an unexcelled forum for the presentation of the geological side of many interdisciplinary scientific and practical issues. It seems to me potentially far more effective to discuss interdisciplinary issues in an interdisciplinary milieu than it is to do so at meetings composed overwhelmingly of geologists. Talking interdisciplinary problems out among ourselves remains useful, but it falls short of presenting the geological point of view to others in a peer and quid pro-quo setting.

On the basis of this limited exposure to Section W and its activities, I suggest:

1. That the GSA, particularly its Hydrogeology Division, is missing an unparaleled opportunity to present its achievements and interpretations to a highly interdisciplinary scientific group.

2. That GSA, particularly its Hydrogeology Division, should plan to sponsor or co-sponsor a Symposium on a relevant aspect of the interactions between hydrogeology and societal problems for the next AAAS meeting (Denver, February 20–26, 1977).

3. That the hydrological (hydrospheric?) members of Section W initiate liaison among themselves and the organizations with which they are affiliated to strengthen the presentation of water-related aspects of problems within Section W and AAAS.

L. A. Heindl
GSA Representative to
AAAS Section W, 1976–1978

Suggestions solicited from GSA members

The Council of the American Association for the Advancement of Science (AAAS) met on February 21, 1976. Of particular interest to GSA is the opinion voiced there of AAAS president William D. McElroy that the " . . . health of the AAAS depends upon a closer relationship with the affiliates. . . ." The AAAS council members have been asked to suggest means to strengthen ties between AAAS and its affiliating organizations. Especially important is the consideration of how to increase the role of the sections (as Section E—Geology and Geography) in the affairs of AAAS. I believe that the individual members of GSA can provide significant suggestions as to how these relations can be enhanced. As GSA representative to AAAS, Section E, I solicit these suggestions from the GSA membership and will compile them for submission to our Section E chairperson.

Please write to: Murray Felsher, GSA Representative to Section E, AAAS, NASA, Code:EK, Washington, D.C. 20546.

International stratigraphic guide published

The complete edition of *International Stratigraphic Guide* has been published by John Wiley & Sons, Inc. Edited by Hollis D. Hedberg, Chairman of the International Subcommission on Stratigraphic Classification (ISSC), this edition consolidates many previously published circulars and preliminary reports of the Subcommission into a "more coherent and comprehensive whole" to be used as a reference by geologists.

Dr. Hedberg states in the Preface, "Stratigraphy is a global subject, and international communication and cooperation are necessary if we wish to adequately comprehend the picture of the rock strata of the Earth as a whole, and to restore the history of how, when, and why these strata came to be what and where they are today."

This book, the result of 20 years of work by the Subcommission, presents an internationally sponsored guide to principles, terminology, and procedure in stratigraphic classification. It sets forth recommendations for procedures in classifying rock strata into units according to various rock properties, and attempts to provide a common language of stratigraphy. Illustrations of principles of stratigraphic classification and an extensive bibliography of some 1,500 entries are included.

Honors and Awards Committee seeks suggestions

The Committee on Honors and Awards needs your help in nominating potential recipients of GSA's highest honors—the Penrose Medal, the Day Medal, and Honorary Fellowship. The criteria for these honors are described in the booklet *Council Rules, Policies, and Procedures,* or you can get a good idea of the kinds of scientists who have been honored in the past by glancing at the lists on pages xii-xiv of your *1975 Yearbook*.

Suggestions for consideration for 1977 awards must be received by headquarters by January 15, 1977. They will be forwarded to the appropriate subcommittee chairmen.

To ensure thorough consideration by the particular subcommittee, please back up each suggested nomination with a *brief biographical sketch* and a *summary of his or her chief contributions to geology.* In the case of the Penrose and Day Medals, a *selected bibliography* must accompany the nomination.

Please follow the same procedure for nominating your candidates for the National Medal of Science.

Necrology

Notice has been received of the following deaths: Per Geijer, Djursholm, Sweden; Percy E. Hopkins, Toronto, Ontario, Canada; Hugo Marek, Jr., Walla Walla, Washington; Michael M. Murray, Houston, Texas; and Ned M. Smith, West Lafayette, Indiana.

July BULLETIN briefs

Brief summaries of articles in the July 1976 GSA Bulletin *are provided on the following pages to aid members who chose the lower dues option to select* Bulletin *separates of their choice. The document number of each article is repeated on the coupon and mailing label in this section.*

☐ 60701—Revision of Upper Ordovician, Silurian, and Lower Devonian stratigraphy, southwestern Great Basin. *Richard H. Miller, Department of Geosciences, California State University, Northridge, California 91324.* (8 p., 8 figs.)

Abundant and diverse conodonts indicate age revisions or refinements for Upper Ordovician, Silurian, and Lower Devonian rocks in the southwestern Great Basin. Measured sections from the Inyo Mountains, northern Panamint Range, and Nopah Range in California and from the Bullfrog Hills in Nevada include the Ely Springs Dolomite, Roberts Mountains Formation, Hidden Valley Dolomite, Vaughn Gulch Limestone, and Sunday Canyon Formation. Using conodonts as indicators, ages of these formations are as follows: (1) the Ely Springs Dolomite ranges from latest Middle Ordovician to Early Silurian, (2) the Roberts Mountains Formation ranges from Early to Late Silurian, (3) the Hidden Valley Dolomite ranges from Early Silurian to Early Devonian, (4) the Vaughn Gulch Limestone ranges from Early(?) Silurian to Early Devonian, and (5) the Sunday Canyon Formation ranges from Early to Middle(?) Devonian.

☐ 60702—Relative motion of South America with respect to North America and Caribbean tectonics. *John W. Ladd, Lamont-Doherty Geological Observatory, Department of Geology, Columbia University, Palisades, New York 10964. (Present address: Geophysics Laboratory, Marine Science Institute, University of Texas, Galveston, Texas 77550.)* (8 p., 3 figs., 2 tbls.)

Magnetic anomalies in the North Atlantic have been analyzed by Pitman and Talwani to determine a sequence of finite difference poles of relative motion of North America with respect to Africa for the time period 180 m.y. B.P. to the present. A similar analysis of South Atlantic magnetic anomalies by the writer determines a sequence of finite difference rotations of South America with respect to Africa for the time period 127 m.y. B.P. to the present. The two sequences of finite difference rotations are used to calculate the relative motion of South America with respect to North America for late Mesozoic and Cenozoic time.

From Triassic to Early Cretaceous time, South America moved to the southeast away from North America. From Early Cretaceous to Late Cretaceous time, South America moved eastward with respect to North America. Southeastward motion of South America occurred again from Late Cretaceous to early Tertiary time followed by northward motion from early to late Tertiary. Tectonic styles in the Caribbean region change when major plate motions change; however, the details of Caribbean geology cannot be explained by simple plate margins between North and South America. Tertiary compressional structures on the northern and southern margins of the Caribbean can be attributed to Tertiary closure between North and South America, but earlier tectonic regimes are not so easily related directly to North America—South America motions.

☐ 60703—Errors in strike and dip measurements. *D. M. Cruden, Departments of Geology and Civil Engineering, University of Alberta, Edmonton, Alberta T6G 2E1, Canada; H.A.K. Charlesworth, Department of Geology, University of Alberta, Edmonton, Alberta T6G 2E1, Canada.* (4 p., 4 figs., 4 tbls.)

If the error in measuring the pole to a surface is symmetrical about the true pole, geometry shows that the standard deviation of repeated measurements of the strike at an outcrop should be directly proportional to the standard deviation of the dip measurements and inversely proportional to the sine of the true dip. This prediction is substantiated by bedding-plane measurements from the Canadian Rocky Mountains. The magnitudes of observed errors depend partly on rock type and dip.

☐ 60704—Gravity investigation in the southeastern Mojave Desert, California. *Yair Rotstein, Jim Combs, Program for Geosciences, University of Texas at Dallas, P.O. Box 688, Richardson, Texas 75080; Shawn Biehler, Department of Earth Sciences and Institute of Geophysics and Planetary Physics, University of California, Riverside,*

Riverside, California 92502. (Present address, Rotstein: Institute for Petroleum Research and Geophysics, P.O. Box 1717, Holon, Israel.) (13 p., 11 figs., 2 tbls.)

A gravity investigation consisting of some 900 stations was conducted over an area of approximately 3,500 km^2 between the Eagle Mountains and the Colorado River in the southeastern Mojave Desert to define the major anomalies. The data were reduced to the complete Bouguer anomaly and presented on a contour map. The density contrasts that exist between the basin sedimentary rocks and the underlying basement rock produce gravity anomalies that can be readily delineated by gravity surveys. Several gravity anomalies are associated with regional structural trends, particularly faults. Two-dimensional model analyses along profiles across five major anomalies are presented to show the distribution and depth of sedimentary deposits.

Subsurface geology in the area is poorly known. Analysis of the gravity anomalies, however, indicates that the basement beneath the sedimentary basins is highly faulted, consisting of complex structures and rapidly varying rock types similar to those in the mountain ranges of the area. In the center of the several subdivisions of the Chuckwalla Valley, depths to basement range from less than 200 m to more than 2 km. The Palen Valley is shallow in the northern section yet reaches a probable depth of over 1.5 km in its southern portion. The Palo Verde Valley east of the Chuckwalla Valley is divided into two separate structural styles. A northwest-trending sedimentary basin in the north has a maximum depth of at least 2 km, while basement to the south is generally more flat and less deep. The structural and geological information inferred from the gravity data and resultant anomalies provides important input toward a better understanding of the geology in the area.

☐ 60705—Nature and implications of asymmetric sea-floor spreading—"Different rates for different plates." *Dennis E. Hayes, Lamont-Doherty Geological Observatory of Columbia University, Palisades, New York 10964, and Department of Geological Sciences, Columbia University, New York, New York 10027.* (9 p., 9 figs.)

Asymmetric sea-floor spreading has occurred south of Australia within narrow longitudinal zones of the Southeast Indian Ocean. The process of asymmetric spreading can be shown to be continuous at the scale of about 10 km or less in contrast to a process involving large, discrete jumps of the ridge-crest position. As there are no discontinuities in the *total* opening rates between the Australian and Antarctic plates, discontinuities in one-limb rates result when asymmetric and symmetric spreading occur in adjacent zones, and ridge-crest offsets (transform faults) are formed as a consequence. In this case, the length of the transform zone changes with time, and the ridge-fracture-zone system does not record the geometry of the initial rift. Other large areas of the world's ocean basins, in particular the northeast and southwest Pacific, have probably undergone similar phases of tectonic evolution. By relating minimum crustal strength to maximum ambient temperature, the preferred locus of asymmetric splitting implies a process of effective asymmetric cooling at the accreting boundary. A simplistic asymmetric cooling model is both quantitatively and qualitatively investigated. The indications of steady-state spreading conditions, which persist for long periods of time but which change to new steady-state conditions quickly, and the existence of abrupt geographic spreading provinces are difficult to reconcile with any thermal models. Variations in the spatial and temporal spreading evolution of the Southeast Indian Ocean are qualitatively examined by considering the effects of a hypothetical heat source or sink that moves relative to the accreting margin.

☐ 60706—Deposits formed by subglacial precipitation of $CaCO_3$. *B. Hallet, Department of Geology, University of California, Los Angeles, California 90024. (Present address: Department of Applied Earth Sciences, Stanford University, Stanford, California 94305.)* (13 p., 9 figs., 2 tbls.)

Limestone and other calcareous outcrops recently exposed by retreating temperate glaciers in the Rocky Mountains are widely covered with patchy carbonate coatings that formed as a result of chemical precipitation under the moving ice. They form because $CaCO_3$ dissolved from the bedrock on the stoss sides of bed obstacles is concentrated at the lee sides by the freezing of the melt water in the regelation-slip process, which is an essential part of the mechanism by which temperate glaciers slide over their beds.

Freezing experiments show that ice grown from $CaCO_3$ solutions at rates similar to those expected in connection with regelation sliding has calcium ion concentrations 50 to 100 times smaller than the solutions; hence the freezing process strongly concentrates solutes in the melt. The experimental results are interpreted in terms of the pertinent phase relations, which were derived numerically on the basis of the most recent solubility data for calcite and an estimate of the freezing point lowering due to the presence of solutes.

The subglacial chemical deposits indicate clearly that chemical exchange is active under temperate glaciers and that glaciochemical processes do at times play a dominant role in modifying the glacial bed. Moreover, they are of particular interest because the chemical and physical processes by which they form may affect the behavior of entire glacial masses by impeding basal sliding.

☐ 60707—Source and tributary-source link lengths in natural channel networks. *Athol D. Abrahams, Ruth N. Campbell, School of Geography, University of New South Wales, Kensington, New South Wales 2033, Australia.* (5 p., 5 figs., 2 tbls.)

Exterior links may be classified according to the type of link they join at their downstream end. Those which join another exterior link are termed "source links," and those which join an interior link are termed "tributary-source links." The length distributions of source and tributary-source links are compared for two areas in eastern Australia where channel networks have developed in dissimilar materials under disparate climatic conditions and have reached quite different stages of evolution. Statistical tests confirm that these two types of link have different length distributions in both areas. In particular, there tend to be relatively more short, and therefore relatively fewer long, source links than tributary-source links. Analyses of length data for both types of links from other areas give similar results. It is concluded that there are inherent differences between the lengths of source and tributary-source links in natural channel networks. These differences are attributed to a tendency for the lengths of tributary-source links to increase downstream as the lengths of the main valley sides on which they have developed increase.

☐ 60708—"Pseudokarst" and "pseudokarst terrains": Problems of terminology. *Ervin G. Otvos, Jr., Geology Division, Gulf Coast Research Laboratory, Ocean Springs, Mississippi 39564.* (7 p., 5 figs., 2 tbls.)

For decades, the term "pseudokarst" has been used for a diversity of landforms, evolved in various types of commonly insoluble, as well as chemically soluble, rocks, sediments, and soils. There is a need to restrict the usage of the term. Morphology, genetic conditions, and the hydrological function were used as criteria in the evaluation of the problem. It is proposed that only processes and forms involving predominantly piping and thermokarst be termed pseudokarstic. Collapse depressions in nonsoluble sediment karst-cover, where piping did not play an important role, are karst-related features. No justification exists for keeping "volcano-karst" as a viable geomorphological term. Nonkarstic honeycombed and (or) pitted terrains (with lava rock, caves, eolian blowouts, ice-surface depressions, and so on) are neither karstic nor pseudokarstic. Field work has shown that the "gravel-and-sand plain pseudokarst terrains" along the Mississippi–Alabama–Florida Panhandle Coast in fact represent Citronelle Formation surfaces dotted by relict eolian and covered karst-related depressions.

☐ 60709—Geochemistry and petrogenesis of primitive alkali basalt from Mauritius, Indian Ocean. *Alistair N. Baxter, Department of Geology, University of Edinburgh, Edinburgh EH9 3JW, Scotland. (Present address: Department of Geology, City of London Polytechnic, 146-150 Minories, London EC3N 1ND, England.)* (7 p., 7 figs., 1 tbl.)

Intermediate Series lava from Mauritius comprises a suite of primitive alkali basalt, basanite, and nephelinite, which display marked primary geochemical enrichment trends for K, Ti, P, Sr, Rb, Ba, and Zr and have probably been erupted unmodified from at least 45 to 60 km (15 to 20 kb). Younger Series lava, primarily alkali basalt with subordinate basanite, displays less well developed primary geochemical enrichment patterns that show scattering compatible with the overprinting effects of low-pressure olivine fractionation.

Incompatible-element enrichment patterns in these series, together with highly variable Rb/Sr, K/Rb, K/Sr, and K/Ba ratios, suggest that small (<10 percent), possibly sequential degrees of partial melting of a single peridotitic mantle were involved in their formation. Low incompatible-element abundances in the Younger Series probably reflect relatively higher degrees of melting, but they may indicate reprocessing of mantle material already depleted in these elements by the earlier Intermediate Series melting event.

☐ 60710—Experimental folding of rocks under confining pressure: Part II. Buckling of multilayered rock beams. *J. Handin, M. Friedman, K. D. Min, L. J. Pattison, Center for Tectonophysics, Texas A&M University, College Station, Texas 77843.* (14 p., 15 figs., 1 tbl.)

Specimens composed of as many as five layers of various combinations of dry Coconino Sandstone (brittle) and Indiana Limestone (ductile) are folded at 1-kb confining pressure. Stress-shortening curves for specimens with aspect ratios ⩾20 are nearly linear up to a maximum stress (critical buckling stress) and then show pronounced post-buckling work-softening. For specimens of equal total thickness, the average maximum stress decreases with an increase in the number (and thickness) of limestone relative to sandstone layers. A single beam of limestone or sandstone has larger maximum stress than does the corresponding three-layer specimen of equal thickness. Curves for limestone specimens composed of from one to five layers and with aspect ratios ⩽13 are monotonic and show poorly defined yield regions and pronounced work-hardening. Both thick-beam (aspect ratios of 7 to 13) and thin-beam (aspect ratios of 20 or more) folds tentatively are regarded as buckles because instabilities probably are involved in the folding.

Fold (anticlinal) shape depends on the mechanical behavior of the bottom layer. When the ductile limestone is lowest, the fold shape is nearly sinusoidal; when the brittle sandstone is lowest, the anticline has a chevron shape. "Bedding-plane" slip is a maximum in the inflection region on the flanks, and the sense of slip is the reverse of that in classical flexural-slip folding.

Dynamic petrofabric interpretations of small thrust and normal faults, macrofractures and microfractures, compresion and extension axes derived from calcite twin lamellae, and the twin-lamellae spacing index indicate that although bedding-plane slip occurs, the entire layered specimen acts as a single mechanical beam throughout most of the folding. In thin, multilithologic folds, the apparent neutral surface is displaced from the center toward the compressed side. In thick, multilayered limestone specimens, large axial shortening prior to bending displaces the neutral surface toward the region of extension, so that even the uppermost layer in the anticlinal hinge can be in the zone of layer-parallel compression.

☐ 60711—Experimental folding of rocks under confining pressure: Part III. Faulted drape folds in multilithologic layered specimens. *M. Friedman, J. Handin, J. M. Logan, K. D. Min, D. W. Stearns, Center for Tectonophysics, Texas A&M University, College Station, Texas 77843.* (18 p., 16 figs., 3 tbls.)

Drape folds and reverse faults are produced experimentally at confining pressures to 2.0 kb and shortening rates of 10^{-3} to 10^{-6} sec^{-1} by displacing a block of brittle sandstone (2 by 3 by 12.6 cm) along a lubricated saw cut into one to five initially intact layers (0.2 to 1.0 cm thick and as much as 12.6 cm long) of limestone, sandstone, and rock salt. The saw cut is inclined at from 30° to 90° to the layer boundary. The deformation is characterized from studies of fault geometry, displacements and sequence, bedding-plane slip, layer-thickness changes, and the development of fault gouge, fold hinges, microfractures, calcite twin lamellae, and dimensional orientations of grains (in the rock salt). Stress trajectories are inferred from faults, microfractures, and calcite twin lamellae, and strains are calculated from layer-thickness changes and from calcite twin lamellae.

Reverse faults curving concave downward propagate upward from the saw cut in the forcing block. With increasing displacement along the precut faults, the faults and associated gouge zones in the layer steepen and become progressively younger toward the upthrown block as displacement increases. The faults are preceded by swarms of extension microfractures that form throughout the deformation and that are the best clues to the stress trajectories. The downthrown layers are thickened by uniform flow and by repetition caused by the faulting. They are displaced away from the faults by bedding-plane slip. Trajectories of the greatest principal compressive stress (σ_1) are inclined at low angles to the layer boundaries near the faults and become perpendicular to these boundaries away from the fault. The maximum deformation of the downthrown block occurs when the saw cut is inclined at about 65° to the layering. The upthrown layers are all extended parallel to the layering and perpendicular to the fold axes. The layers are translated by bedding-plane slip away from the fault zone. Trajectories of σ_1 are inclined from 45° to 90° to the layering.

The fabric data are internally consistent, and inferred stresses are in good agreement with those calculated from an elastic solution of the experimental boundary conditions. Principal strains calculated from calcite twin lamellae are within an average of 0.01 of those calculated from layer-thickness changes and permit clear resolution of individual events in domains of superposed deformations.

☐ 60712—Age and origin of the Stone Mountain Granite, Lithonia district, Georgia. *James A. Whitney, Lois M. Jones, Department of Geology, University of Georgia, Athens, Georgia 30602; Raymond L. Walker, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830.* (11 p., 7 figs., 4 tbls.)

Petrographic, geochemical, and strontium isotopic studies have been conducted on samples of the Stone Mountain Granite (leucocratic quartz monzonite) from the Lithonia district, within the Inner Piedmont province of Georgia. A Rb-Sr isochron obtained from 10 whole-rock and 3 mineral samples yielded an age of 291 ± 7 m.y. and an initial Sr^{87}/Sr^{86} ratio of 0.7250 ± 0.0005. Petrologic and geochemical data, combined with the high initial strontium isotopic ratio, suggest that the origin of this peraluminous quartz monzonite can best be explained by the anatexis of an older peraluminous, granitic crustal material during Late Pennsylvanian time. The depth of intrusion was probably around 12 km, with initial magma temperatures of 700°C or less. Magma generation could have occurred at depths of 22 to 28 km, depending on the regional geothermal gradient at the time. The most likely source material is the Lithonia Gneiss, which has a peraluminous, granitic composition and underlies the area.

The Stone Mountain pluton extends the 300-m.y.-old intrusive belt in the southern Appalachians across the Piedmont province to just south of the Brevard lineament. Its implied depth of intrusion fits well with certain models for the development of the Inner Piedmont and Blue Ridge provinces in the Carolinas because it requires rapid removal of considerable overburden. The origin and magmatic history of this intrusive unit may find use as a model for other peraluminous granitic plutons having similar petrologic, geochemical, and isotopic characteristics.

☐ 60713—Ophiolite emplacement and the evolution of the Taurus suture zone, southeastern Turkey. *Robert Hall, Department of Geology, University College, University of London, London WC1E 6BT, Great Britain. (Present address: Department of Geology, University College Galway, Galway, Ireland.)* (11 p., 5 figs.)

The interior of the southeastern Taurus Mountains of Turkey is occupied by an extensive area of metamorphic rocks known as the Bitlis Massif, previously regarded as pre-Permian in age. An ophiolitic mélange occurs within the Bitlis Massif, and detailed mapping has shown that the mélange can be subdivided and an internal structure recognized. It contains components of Late Cretaceous age, some of which have been metamorphosed, indicating an Alpine metamorphic event. It is proposed that the Bitlis Massif is a composite structural entity consisting of a northern area of pre-Permian metamorphic rocks and a southern zone of Alpine rocks that have undergone high-pressure–low-temperature metamorphism.

The Bitlis Massif is thrust southward over an ophiolite-flysch complex, which is also thrust southward over sedimentary rocks of the Arabian foreland. The ophiolite-flysch complex is here divided into three zones, one of which is an ophiolitic-wildflysch zone correlated with ophiolitic gravity slides occurring farther west in the southeastern Taurus Mountains.

In the tentative plate-tectonic model for the evolution of a section of the southeastern Taurus Mountains presented here, two episodes of ophiolite emplacement are recognized. It is suggested that the ophiolitic-wildflysch represents trench mélanges that were not subducted but were thrust out of the trench zone because of uplift associated with the final phase (Late Cretaceous) of subduction. The metamorphosed ophiolitic mélange is thought to represent successfully subducted mélange emplaced during the final phase (Miocene) of continental collision.

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