GSA news & information

SUPPLEMENT TO GEOLOGY MAGAZINE

New policies adopted for GSA books

For many years, the Society has published books even though it was evident that the cost of publication and distribution of a certain proportion of them could not be recovered through sales.

In view of the present financial state of the Society, it is apparent that the overall cost of book publications must be approximately balanced by income from books. It is also desirable to reduce the sale price wherever possible, while recognizing that the total volume of high-quality scientific manuscripts is increasing. These factors were all considered, and at the 1975 spring meeting, the Council decided that henceforth the Society must consider the market factor in deciding which books to publish and in which form of publication.

Books that have a reasonable chance to return the money that GSA invests in them will continue to be printed in the Special Paper or Memoir series. Books that are of scientific value but are expected to have a limited, specialized audience will be published in the newly established Microform Publication series. In a few years, it is anticipated that the Microform Publication series will be a principal medium for GSA book publications regardless of sales level because of its rapid production and great economy.

The Council also adopted a policy to require that authors of monographs and volume editors of books with multiple papers must meet the editorial standards of GSA as well as scholarly standards *before* the papers can be accepted for publication.

This means that such matters as citation style, capitalization, grammar, mathematical formulas, proper use of stratigraphic nomenclature, bibliographic references, proper presentation of tabular data, geographic place names, call-out of figures in sequence, and so forth, will be the *full* responsibility of authors and volume editors. Volume editors must, in addition, see that a consistent style of presentation is used in each paper in the volume, and all authors will be expected to follow GSA style as exemplified in recently published works. The staff of GSA will check manuscripts, advise on types of errors or problems that should be corrected, and return the manuscripts for final editing by the authors, but the staff will not perform the same copy editing service for book articles that it has in the past or that it continues to do for *Bulletin* and *Geology* articles.

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GSA now requires camera-ready tables

The Society must ask that tables in articles accepted for publication in the *Bulletin* be prepared in an acceptable format, and that they are ready to be printed as submitted. We can no longer retype tables, so those that do not meet GSA specifications will be returned to the authors for camera-ready typing. GSA can make local arrangements for retyping at the authors' expense, for those who need it.

Pay your dues early and receive GSA publications without delay

Your statement for 1976 dues will arrive shortly, and we would like to remind you that an early payment will ensure uninterrupted receipt of the publications you desire.

There are five options to choose from in 1976, and mailings cannot be activated until we know the option package you are selecting, and until we have processed your payment accordingly.

January issues of *Geology* and the *Bulletin* will be mailed from our printer in Vermont toward the end of December. If your payment and option selection do not arrive at headquarters before the end of November, your first issues will be delayed at least four weeks.

Those of you taking an option that includes issues of *Abstracts with Programs* must choose the section meeting issue you want as quickly as possible (see the back of the dues statement for making these selections). Mailings for the section meetings begin in January and are completed by mid-March, so issues ordered after December 31 are apt not to be processed in time for you to receive your choices before the meeting date.

We know it sounds confusing, but an early response from you is the only sure means of enabling us to send you the publications you want without delay.

New policies for books (continued)

At the 1974 fall meeting of the Council, a policy was reaffirmed to discontinue the publication of symposia and festschrift volumes in the Special Paper and Memoir series. Symposia and festschrift volumes, however, may be published in the newly established Microform Publication series, which can be produced more rapidly and at lower cost than comparable books.

The Microform Publications are published on microfiche with 98 frames per fiche. The microfiche usually can be produced in less than two months from date of acceptance of a paper, as compared to about a ten-month minimum publication time for small books. Convenors of symposia, for example, by advance planning and by submitting well-written and reviewed manuscripts, could have microfiche of all papers in a symposium available at the time of the session. The papers need to be submitted to GSA ready to photograph only about two months before the session.

The microfiche also provide an opportunity to publish high-quality reproductions of photographic plates that otherwise are very costly to print (for example, photographs of fossils). There would be, for instance, no problem of losing detail on halftone illustrations because of printing factors. Both negative and positive film can be used to provide readers with appropriate illustrations.

Other advantages of microfiche include low prices, the small storage space needed, and ease in replacing a fiche that gets separated from a set or series.

The recently created Map and Chart series is proving to be an excellent way for the Society to provide information formerly published as foldout illustrations in the *Bulletin* or not published at all. Papers that must be accompanied by such illustrations can now be published in Special Papers or Memoirs, or the text can be published in the *Bulletin* with the map published separately in the Map and Chart series, or the text may be published as an abbreviated article that accompanies the map in the Map and Chart series. If warranted, the complete text of articles can be placed on microfiche to accompany a map or chart in the series.

GSA now has a full range of publishing media that should help to accommodate the publishing needs of the geological sciences during the next few years. Book-length papers and collections of papers that have a large potential audience will continue to be published as Special Papers or Memoirs. Some books include microfiche of supplemental data and larger-than-page-size illustrations, including color, if warranted.

For book-length papers that will have a potentially small, specialized readership, the Microform Publication series will provide the best method for publication. The *Bulletin* continues to be the principal medium for scientific articles of appropriate scope and length; *Geology* is used primarily for short articles of current interest. All material for publication will continue to be subject to peer review regardless of the series in which it is published.

Medal and award winners for 1975 announced

The 1975 medalists and award winners announced by the Council at its May 1975 meeting are as follows:

Penrose Medal
Francis J. Pettijohn, Department of Geology, Johns Hopkins University, Baltimore, Maryland 21218

Day Medal
Allan V. Cox, Department of Geophysics, Stanford University, Stanford, California 94305

Honorary Fellows
Stanislaw Dzulynski, Geology Department, Jagellonian University, Oleandry 2a, Krakow, Poland, *and*

A. V. Peive, Director, Geological Institute, Academy of Sciences of the USSR, 9 Pyzhevsky per., Moscow 109017, Russia

Kirk Bryan Award
James B. Benedict, University of Colorado, Boulder, Colorado 80302, for his paper, "Downslope soil movement in a Colorado alpine region: Rates, processes and climatic significance": *Arctic and Alpine Research,* v. 2, no. 3, p. 165-226.

Meinzer Award
John D. Bredehoeft, U.S. Geological Survey, 413 National Center, Reston, Virginia 22092, *and* George F. Pinder, Department of Geological and Geophysical Sciences, Princeton University, Princeton, New Jersey 08540, for their joint paper, "1973 Mass Transport in Flowing Groundwater": *Water Resources Research,* v. 9, no. 1, p. 194-210.

Burwell Award
Erhard M. Winkler, Department of Geology, University of Notre Dame, Notre Dame, Indiana 46556, for his work, *Stone: Properties, Durability in Man's Environment:* Springer Verlag, 1973.

Cady Award
Jack A. Simon, Illinois State Geological Survey, Natural Resources Building, Urbana, Illinois 61801, for outstanding leadership in the field of coal geology.

Council lists nominations for 1976

For Councilor (1976-77) and President (1976)
Robert E. Folinsbee, Edmonton, Canada

For Councilor and Vice-President (1976)
Charles L. Drake, Hanover, New Hampshire

For Councilor and Treasurer (1976)
August Goldstein, Jr., Tulsa, Oklahoma

For Councilors (1976-78)
W. G. Ernst, Los Angeles, California
Howard R. Gould, Houston, Texas
Digby J. McLaren, Ottawa, Canada
Brian J. Skinner, New Haven, Connecticut

The Geological Society of America

Annual Report for 1974

Part 4. Reports of the President and the Committee on Investments

Report of the President

To the Council and Membership of The Geological Society of America, Inc.:

In reading the reports of former presidents of the Society, I sense a certain perennial feeling of frustration in that financial problems of the Society have preoccupied the attention of the officers during their tenures far more than they would have wished or were really prepared for. The year 1974 was certainly no exception, as the membership is perhaps more painfully aware than ever before, because of increased dues and other costs. The officers and councilors have tried to keep the membership cognizant of these growing problems during the year, and I particularly want to acknowledge the many thoughtful letters I have received in response to our requests for your opinions on these difficult problems. I know that many of our fiscal decisions have not met with universal acclaim, and some have had to be arrived at far more hastily than we would have wished, but let me assure you that your opinions have been of value and have been heeded. In particular, the present policy of letting members select from among various membership dues options is almost a direct outgrowth of suggestions that we received. It is our hope that this system will not only allow members to feel that they are getting their money's worth in ways of their own choosing, but that it will also allow the Society to determine directly which publications really *are* wanted and to tailor its publications program accordingly.

The guiding principle in reaching financial decisions has been to make sure that the Society's endowment is not dissipated to the extent that geologists in the future will be unable to receive the same benefits from the Penrose Fund that we do today. Such decisions involve not only wisdom in planning current budgets but also a large degree of judgment and foresight regarding economic trends in the future. The Society is fortunate that so many competent members with these talents—August Goldstein, Jr., in particular—have unselfishly donated their services in our behalf. I sincerely hope that the membership will not blame them for the stock-market trends and inflation that have caused a good share of our recent problems, any more than the membership will associate me directly with the downslide that occurred in the market during my term as president (and which turned around at almost the same moment that I left office!). As I write this report, there is already hope that Julian Goldsmith, my successor, will see the Society enjoy a more prosperous and encouraging year.

In Society affairs, certainly the most noteworthy event of the year was the retirement of Ed Eckel as executive secretary and the assumption of his duties by John Frye. I meant it when I stated both in *The Geologist* and at the annual dinner in Miami Beach that Ed Eckel's services to the Society have been nothing short of monumental and that we all owe him a tremendous debt of gratitude. Both in his service as science editor and subsequently as executive secretary, Ed brought innovative and imaginative approaches to the Society's efforts, and he built a staff of employees at Boulder whose productivity and esprit de corps are testimony of his leadership. Ed will be sorely missed.

I am happy to report to the membership that the transition from Ed's leadership to that of John Frye has been a smooth one and that the efficiency and morale of the headquarters staff remain high. The officers and councilors have been highly pleased with John's initial accomplishments, although we feel a bit guilty that, almost immediately upon his arrival in Boulder, he was completely engulfed in fiscal problems of a seriousness that neither we nor he had fully anticipated. But, working closely with Steve Hoskin, John has put forth constructive and forward-looking solutions that, although necessarily unhappy in many respects, have been greatly appreciated by the officers

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and councilors. Many of you may not be aware, incidentally, that John's title has been changed from executive secretary to executive director—not because of any real change in duties or responsibilities, but primarily in recognition of the recent use of this term in other organizations and in societies comparable to ours. As much as we regret Ed Eckel's departure upon his retirement, we heartily welcome John Frye, and I am pleased to report that the Society appears to be in excellent hands.

Most of the specific accomplishments of the Society during the year have been summarized in other sections of this *Annual Report*, and I will not attempt to repeat them. I think that the Society can be proud of its record in recent years in attempting new and innovative approaches in fulfilling its mission, the promotion of the science of geology. Some of these efforts have naturally been more successful than others, but no one can accuse us of being static. Recent financial curbs have made it harder to experiment than previously, but the officers and councilors are determined to continue to use at least part of the endowment income in the promotion of new programs that, if successful, can then be gradually transformed to completely self-supporting bases. This has, for example, been the history of the Penrose Conference program, and the journal *Geology* will shortly become fully self-supporting except for student subscriptions. Many of these innnovative ideas have come from the Council as well as from the headquarters staff, and I hope that the Society will continue to nominate and elect imaginative and provocative councilors who represent the best geological talent in North America. It would be a mistake, in my opinion, to elect councilors solely on the basis of sectional or divisional representation, as has again recently been suggested.

During the year, I was able to attend five of the six section meetings, and I found these lively and scientifically rewarding. It seems that many section meetings could, however, use more good papers, and to those who complain that the annual meetings are becoming too crowded and formalized, let me recommend greater support of the section meetings. The opportunities for papers to be heard and discussed by interested colleagues are greater than many members realize. Despite its large size, the Miami Beach meeting was a thorough success. This is largely due to the efforts of the Local Committee, which, despite some unexpected roadblocks, came through with a beautifully organized affair. I personally am indebted to Mike Wahl and his crew; their accomplishments constitute a real challenge to future local committees. The greatest challenge, however, will be to continue to draw significant and exciting papers to our meetings, and this is the reason that I have pushed hard during the year to keep the due dates for abstracts for meetings as late as possible, even at the expense of some quality in the published volumes of abstracts. Mail-delivery schedules will be a continuing problem for us. But for me, the scientific quality and timeliness of the papers presented at our meetings should have first priority over all other considerations, including those of perfection in the meeting organization and abstract publications.

The degree to which Student Associates should be subsidized continues to be a subject of discussion. All officers and councilors have agreed that encouraging young earth scientists to join the Society and participate in its activities is terribly important to the Society's future, and we fully recognize that some subsidization is necessary in view of the financial problems faced by virtually all students. Furthermore, the Society's research-grants program traditionally has been almost completely in support of graduate students, Associates and non-Associates alike. Nevertheless, there is continuing debate as to the extent that other programs of the Society should be curtailed or made more expensive because of the student subsidy. A general feeling seems to have evolved that regular members should pay their full share of proportional costs for subscription publications and headquarters operation and that endowment income should be devoted largely to student subsidies, research grants, amortization of the headquarters building, and the temporary subsidy of new and experimental programs. (In addition, of course, meetings and nonsubscription publications are expected to be fully self-supporting, including indirect costs to headquarters.) I support this philosophy, at least in the present financial climate, although it has obviously come as a shock to many members (including me) to learn how much publications really cost.

Finally, I want to express my gratitude to all the members of the headquarters staff who have helped me and the other officers in the course of our duties during the past year. To name particular individuals would be unfair to the others; suffice it to say that it's a remarkable gang of people, and they have my heartfelt thanks. I also appreciate the patience and good humor of the councilors, as well as the vigor, provocation, and diversity of opinion that it is their duty to provide; they did it well! The Geological Society of America continues to be a healthy and flourishing organization, and it has been an honor to serve as its president during the past year.

Clarence R. Allen, President

Report of the Committee on Investments

To the Council and Membership of The Geological Society of America, Inc.:

The Committee on Investments is pleased to submit its report on the investments of the Society for 1974.

On December 31, 1974, the market value of the combined investment accounts of the Society was $6,816,989 as compared with $9,101,211 on December 31, 1973, reflecting the severe decline in the stock market during 1974.

As indicated in the 1973 report, the committee followed the law of contrary opinion and took advantage of the declining market to buy seasoned growth stocks at prices 5% to 15% below those prevailing in February 1974. We believed that the Geological Society of America acquired a further share in the well managed companies of America at bargain prices, and that at year end the portfolio stood poised for growth. This faith has been justified to some extent for by March 17, 1975, the value of the portfolio had recovered to $7,952,006—a gain of $1,135,000 or 16.6%.

On the advice of investment counsel, certain weak holdings were trimmed or eliminated. These sales, though providing funds for purchases, resulted in a realized capital loss of $370,661. The income from dividends and interest is budgeted for 1975 at $366,000, a figure close to the $374,000 realized in 1974.

Harry Burgess assumes chairmanship of the committee in 1975. He brings a wealth of experience from his years with the Kennecott Copper Corporation whose major property, Bingham, was the source of most of the money in the original Penrose endowment. Our thanks go to retiring committee member John L. Loftis. A particular acknowledgment must go to our Treasurer, August Goldstein, Jr., for his part in establishing a sound modern investment policy of great promise. Fifty percent of the Geological Society of America portfolio consists of common stocks with good growth characteristics. These should outperform the Dow Jones industrial average (as projected by Forbes) and protect the future buying power of our endowment. The remainder of the portfolio consists of high-grade bonds and money instruments whose yield covers some of our immediate needs.

THE GEOLOGICAL SOCIETY OF AMERICA, INC.
SUMMARY OF INVESTMENTS BY FUNDS
DECEMBER 31, 1974

Principal amount	Security	Cost	Approximate market value
	Penrose Endowment Fund		
$ 308,000	U.S. Government & Agency Obligations	$ 306,800.40	$ 297,891.34
1,764,500	Corporate	1,747,870.83	1,577,256.00
100,000	Canadian Government	100,000.00	100,000.00
375,000	Convertible Fixed Income	365,718.75	274,050.00
	Common Stocks	3,789,196.07	3,113,239.22
Total Penrose Endowment Fund Investments		$6,309,586.05	$5,362,436.56
	Income Stabilization Fund		
$ 31,000	Short Term Investments	$ 31,000.00	$ 31,000.00
50,000	U.S. Government & Agency Obligations	50,137.50	49,725.00
Total Income Stabilization Fund Investments . .		$ 81,137.50	$ 80,725.00
	General Reserve Fund		
$ 9,000	Short Term Investments	$ 9,000.00	$ 9,000.00
50,000	Convertible Fixed Income	53,550.00	34,250.00
	Common Stocks	204,138.72	209,975.00
Total General Reserve Fund Investments		$ 266,688.72	$ 253,225.00
	Current Fund		
$ 232,000	Short Term Investments	$ 232,000.00	$ 232,000.00
186,000	U.S. Government & Agency Obligations	177,813.68	181,350.00
60,000	Corporate	60,000.00	56,775.00
	Common Stocks	10,631.25	826.88
Total Current Fund Investments		$ 480,444.93	$ 470,951.88
	Arthur L. Day Medal Fund		
$ 7,000	Short Term Investments	$ 7,008.75	$ 6,990.00
12,000	Corporate	12,000.00	11,355.00
20,000	Convertible Fixed Income	22,750.00	14,100.00
	Common Stocks	12,006.98	3,000.00
Total Arthur L. Day Medal Fund Investments . . .		$ 53,765.73	$ 35,445.00
	Penrose Medal Fund		
$ 5,000	Short Term Investments	$ 5,000.00	$ 5,000.00
4,000	Corporate	3,990.00	3,785.00
Total Penrose Medal Fund Investments		$ 8,990.00	$ 8,785.00
	Kirk Bryan Memorial Fund		
$ 7,000	U.S. Government & Agency Obligations	$ 6,767.50	$ 6,916.26
6,000	Corporate	6,000.00	5,677.50
Total Kirk Bryan Memorial Fund Investments . . .		$ 12,767.50	$ 12,593.76
	Retirement Reserve Fund		
$ 46,000	Short Term Investments	$ 46,000.00	$ 46,000.00
134,000	U.S. Government & Agency Obligations	134,740.00	130,433.78
173,427	Corporate	174,052.69	155,802.69
50,000	Convertible Fixed Income	52,206.25	34,250.00
	Common Stocks	155,133.15	92,781.25
Total Retirement Reserve Fund Investments . . .		$ 562,132.09	$ 459,267.72
	Major Repairs Fund		
$ 53,000	Short Term Investments	$ 53,000.00	$ 53,000.00
60,000	U.S. Government & Agency Obligations	60,346.25	59,800.00
Total Major Repairs Fund Investments		$ 113,346.25	$ 112,800.00
	Stearns Award Fund		
$ 10,000	Short Term Investments	$ 10,000.00	$ 10,000.00
Total Stearns Award Fund Investment		$ 10,000.00	$ 10,000.00

Respectfully submitted,

C. Harry Burgess, Peter T. Flawn, August Goldstein, Jr. (Treasurer), William B. Heroy, Jr., John L. Loftis, James Boyd (Conferee), Robert E. King (Conferee), and Robert E. Folinsbee (Chairman)

Preliminary announcement and call for papers
CORDILLERAN SECTION, 72nd ANNUAL MEETING
Pullman, Washington, April 5-7, 1976

THE CORDILLERAN SECTION of the Geological Society of America will hold its 72nd annual meeting with the 63d annual meeting of the Paleontological Society, Pacific Coast Section, at Washington State University, Pullman, Washington, on April 5-7, 1976.

WELCOMING PARTY. A no-host cocktail party will be held on Sunday evening, April 4, at Austin's (near campus entrance).

REGISTRATION. Registration will be by preregistration and also in the first floor street lobby of the Physical Sciences Building, Washington State University, Sunday, April 4, from 4 to 8 p.m. and during the meetings. Preregistration costs are $11 for professionals and $2 for students. On-site registration is $13 or $4, respectively. All are urged to take advantage of the lower preregistration rates. ***Preregister before March 15, 1976.*** Refunds on canceled preregistration will be made in full until April 1, 1976.

SYMPOSIA: ***The Idaho Batholith and Its Tectonic Setting; The Geology and Tectonics of the Blue Mountains Province; Petrogenesis of the Columbia River Basalts; Hydrogeology of Basalt Terranes;*** and ***Late Cenozoic Environments of the Pacific Northwest.***

FIELD TRIPS. Premeeting (all April 3-4): ***(1) Vent Areas, Intracanyon Basalts, and Stratigraphy of Yakima Basalts in Southeast Washington; (2) Erosional and Depositional Features of the Cahnneled Scablands of Washington I; (3) Hydrology and Engineering Geology of the Columbia Basin; (4) Sections through the Idaho Batholith and Its Envelope.*** Postmeeting: ***(5) Prebasalt and Basalt Stratigraphy of Hells Canyon*** (April 8-9); ***(6) Channeled Scablands II*** (April 8-9); and ***(7) Coeur d'Alene Mining District, Underground Trip*** (April 7-8).

ABSTRACTS, which are limited to 250 words, ***must*** be submitted camera ready on official abstract forms available from

Joseph W. Mills
Program Committee Chairman
Department of Geology
Washington State University
Pullman, Washington 99163
(509) 335-3040; 335-3009

or

Abstracts Secretary
Geological Society of America
3300 Penrose Place
Boulder, Colorado 80301
(303) 447-2020

Abstracts are due November 3, 1975. Please note that recent Council action requires that $20 (check or money order made payable to the Geological Society of America) accompany each abstract. If the abstract is not accepted, the $20 will be returned.

Acceptance or rejection of abstracts will be based on the abstracts as submitted by the author.

SEND ONE ORIGINAL AND THREE COPIES TO

Joseph W. Mills
Department of Geology
Washington State University
Pullman, Washington 99163
(509) 335-3040; 335-3009

All papers in ordinary sessions will be 15 minutes, plus 5 minutes for discussion.

All abstracts will be reviewed by an Abstract Review Committee for informative content, correct structure, reliability of data, Cordilleran Section geographic coverage, and originality. To assist the committees with this review process, authors are requested to submit with their abstract a list of all papers presented at professional meetings during the past three years. Please list your name, publication date, title of paper, and initials of organization sponsoring meeting on a separate sheet of paper and attach it to the abstract form. Only one paper will be accepted from a single author; if papers are co-authored, no more than one paper may be presented by an author. Authors will be notified of acceptance by ***February 10, 1976.***

CAROUSEL PROJECTION EQUIPMENT will be provided for 2"-x-2" (35-mm) slides only (dual projectors by prior request only). Please bring your own loaded carousel trays if possible.

TRANSPORTATION. Bus transportation, if needed, will be provided free, or for a nominal charge, from the campus to more distant motels. Schedules will be provided.

BUSINESS MEETING. The business meeting and luncheon will be at noon on Tuesday, April 6.

DETAILED INFORMATION concerning registration and other activities will appear in the News & Information section of a later issue of **Geology** and as a part of the **Abstracts with Programs for 1976.**

ADDITIONAL INFORMATION, REQUESTS, or SUGGESTIONS should be directed to

W. Frank Scott, Local Committee Chairman
Department of Geology
Washington State University
Pullman, Washington 99163
(509) 335-3002; 335-3009.

Send to William H. Knight, Cordilleran Meeting Housing, Engineering Extension, Washington State University, Pullman, Wash. 99163

HOUSING INFORMATION AND RESERVATION FORM

NAME_____
ADDRESS_____
CITY_____ STATE & ZIP_____
AFFILIATION_____

Registrants for the Cordilleran Section Meetings are expected to fill all available motel rooms in Pullman, Washington, and Moscow, Idaho. It may be necessary to house some who do not preregister in Lewiston, Idaho, 35 miles away. Therefore, preregistration is important and twin rooms must be shared if at all possible. The following accommodations and room rates are expected to prevail:

Single, $15 to $18	Double (1 double bed), $16 to $20
Twin (twin or 2 double beds), $18 to $22	Extra person with roll-away bed, $4

Please indicate choice above and circle nights below.

April 2 April 3 April 4 April 5 April 6 April 7

☐ I will not have an automobile.
☐ I will have an automobile, but do not wish to be housed outside of Pullman.
☐ I will have an automobile and will accept housing in Moscow (8 mi) or Lewiston (35 mi) if necessary.
☐ I will accept housing in Pullman or Moscow, but not Lewiston.
☐ I plan to share a twin or triple room with _____ _____
☐ I will share a twin room with an assigned registrant.

THE ASSIGNED MOTEL WILL CONFIRM AND MAY REQUEST AN ADVANCE DEPOSIT.

Sleeping bag space in the Washington State University Coliseum will be provided for students for about $1.25 per night. Toilets and showers are available.

☐ *Reserve student space for ___ students.*

Preliminary announcement and call for papers
NORTH-CENTRAL SECTION, 10th ANNUAL MEETING
Kalamazoo, Michigan, April 28 - May 1, 1976

10TH ANNUAL MEETING — NORTH-CENTRAL SECTION
10TH ANNUAL MEETING — PANDER SOCIETY
3RD ANNUAL MEETING — NORTH-CENTRAL SECTION, PALEONTOLOGICAL SOCIETY
ANNUAL MEETING — EAST-CENTRAL SECTION, NATIONAL ASSOCIATION OF GEOLOGY TEACHERS

THE NORTH-CENTRAL SECTION of the Geological Society of America will hold its tenth annual meeting at Western Michigan University, Kalamazoo, Michigan, April 28-May 1, 1976. The meeting is being held jointly with the North-Central Section of the Paleontological Society, Pander Society, and East-Central Section of the National Association of Geology Teachers. The meeting is sponsored by the Department of Geology, Western Michigan University.

CALL FOR PAPERS. Papers are invited for presentation at the symposia and technical sessions. Most papers will be allowed 15 minutes for presentation and 5 minutes for discussion. Time allocations will be rigidly controlled by the chairmen. The main symposia and technical session themes are listed below and several other general sessions will be included. ***Deadline for abstracts is December 15, 1975.***

SYMPOSIA AND TECHNICAL SESSIONS. Symposia: ***Petrology of the Upper Mantle; Development of the Michigan Basin.*** Technical sessions: ***Clay Mineralogy; Geochemistry and Mineralogy; Geomorphology; Geophysics; Hydrogeology; Environmental Geology; Engineering Geology; Glacial Geology; Geology and Archaeology; Mathematical Geology; Paleontology and Paleoecology; Sedimentology; Conodont Paleontology; Structural Geology; General Geology; Petrology; Geology of Lakes and Estuaries.***

FIELD TRIPS: ***Glacial Geology of the Kalamazoo Area; Geology of the Kentland Dome; Silurian Reefs of Northern Indiana;*** and ***Coastal Geology of Eastern Lake Michigan.***

ABSTRACTS, which are limited to 250 words, ***must*** be submitted camera ready on official abstract forms available from

W. Thomas Straw
Program Committee Chairman
Department of Geology
Western Michigan University
Kalamazoo, Michigan 49008
(616) 383-1775

or

Abstracts Secretary
Geological Society of America
3300 Penrose Place
Boulder, Colorado 80301
(303) 447-2020

Abstracts are due by December 15, 1975. Please note that recent Council action requires that $20 (check or money order made payable to the Geological Society of America) accompany each abstract. If the abstract is not accepted, the $20 will be returned. Acceptance or rejection of abstracts will be based on the abstract as submitted by the author.

SEND ONE ORIGINAL AND TWO COPIES TO

W. Thomas Straw
Program Committee Chairman
Department of Geology
Western Michigan University
Kalamazoo, Michigan 49008
(616) 383-1775

SPOUSES' ACTIVITIES. A full schedule of activities is being organized.

STUDENT PAPERS. Cash awards will be made to students for one or more of the better papers presented on their research. To qualify, papers submitted should have student authorship exclusively and be designated as student papers.

THE NATIONAL ASSOCIATION OF GEOLOGY TEACHERS, East-Central Section, will also meet at Kalamazoo on April 30, 1976. A technical session and short course program are planned. For further details write to

Richard N. Passero
Department of Geology
Western Michigan University
Kalamazoo, Michigan 49008

PROJECTION EQUIPMENT consisting of one 2"-x-2" (35-mm) carousel projector will be available. Flashlight type pointers will be provided.

EXHIBITS. Exhibit space will be available. Rental costs will be $50 for 8 x 5 ft of space. Society and educational exhibitors will be charged $25.

DETAILED INFORMATION concerning registration, accommodations, and other activities will appear in the News & Information section of a later issue of **Geology** and as a part of the **Abstracts with Programs for 1976.**

ADDITIONAL INFORMATION, REQUESTS, or SUGGESTIONS should be directed to

Lloyd J. Schmaltz
Local Committee Chairman
Department of Geology
Western Michigan University
Kalamazoo, Michigan 49008
(616) 383-1775

or

W. Thomas Straw
Program Committee Chairman
Department of Geology
Western Michigan University
Kalamazoo, Michigan 49008
(616) 383-1775.

Membership

New Members

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J. D. Mudie

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John Suppe

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Jaan Terasmae
R. W. Thompson
Robert H. Tschudy
Donald Turcotte

Jan E. van Hinte
Wm. Randall Van Schmus

Change of address notice requires 6 weeks

The staff in the Membership Department is keenly aware of the mobility of Society members, particularly students. We are interested in serving you well, so that your publications arrive on time and at the correct address, but we need your help in doing this. You need to allow six weeks notice of a move before we can effect a change on our computerized mailing list, and if you are one of the few who change addresses several times during the summer, your publications may not catch up with you for three or four months. We know it is irritating to pay postage for forwarding or, even worse, to have your Society mailings thrown into the U.S. Postal Service Garbage Heap. Please help us by limiting your address change notifications to permanent changes rather than temporary ones and give us six weeks advance notice, if at all possible.

Your *Bulletin* and *Geology* magazine are mailed directly from the printer in Burlington, Vermont. We process all changes for the computer at the end of every month and send mailing labels to Vermont by the middle of the month. As a result, changes of address received by us during the month of August, for example, were processed by the first of September on the computer and sent to Vermont for mailing of the October issues. We are always one month ahead in our printing schedule.

You are also probably aware that in any organization with 12,000 members there are many with identical names. It helps us keep the records straight if you enclose the mailing label or your account number with your address change and dues payments.

GSA maintaining "interest profiles"

Those of you who are requesting separate *Bulletin* articles under this year's low-option plan may be interested to know that a record is being kept of the papers that each person requests.

Eventually, the information will be used to develop interest profiles and will likely become an element in devising a system in which the articles also can be sent without a request being necessary.

An additional use of the information is to develop a cross section of interest of the membership with the aim of perhaps publishing papers of low or specialized interest in other media.

Manuscript length limit must be enforced

We must enforce the length limits of 50 manuscript pages for *Bulletin* articles and 16 manuscript pages for *Geology* articles. Many papers that are submitted to GSA do not exceed the length limit in terms of the number of pages of text, but they contain, in addition, figure captions, reference lists, appendixes, tables, and figures. *All* material is considered in determining the length limits.

We now have no recourse, in the case of *Geology* articles, but to refuse to publish articles that will exceed 4 printed pages. In the case of lengthy articles submitted for the *Bulletin*, the author can be given an option to reduce to length of an article or to have it published as a Special Paper.

One manuscript page is about the equivalent of one-quarter of a printed page.

New Members (continued from p. 512)

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Letters

Outlets available for computer programs

In the March issue of *Geology*, I outlined some possible sources of computer programs of interest to geologists, one of the prime sources being the new Pergamon journal *Computers & Geosciences* (scheduled to appear in 1975). Now the Indiana Geological Survey initiates a new series, *Geophysical Computer Programs*. The first one is titled "FORTRAN Program for the Upward and Downward Continuation and Derivatives of Potential Fields." The format is standard for this type of publication: an introduction, discussion of the method, listing of the program, and examples with test data.

In the remarks introducing the new series, the editors note they will accept papers for publication in the area of geophysics with advice and counsel of an editorial board. "The primary purpose of this series will be to make readily available those programs that deal with established geophysical computations." Additional information on submitting papers for consideration in the series should be addressed to the editors, Albert J. Rudman and Robert F. Blakely at the Indiana Survey. The series promises to be an exciting one, and thus another gap in the publication outlet for computer programs is filled. We await subsequent programs.

Daniel F. Merriam
Department of Geology, Syracuse University, Syracuse, New York 13210
Member, GSA Committee on Publications

Necrology

Robert K. Doten, Richmond, Vermont
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Are you interested in attending?

WHAT:	GSA Penrose Conference
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Objects to quantification

Excerpt from a letter to John C. Frye, Executive Director:

. . . I object to the degree of quantification now apparent in the *Bulletin*. I've got a PhD in geology, yet I can't read your *Bulletin*. I wonder how many members can?

Once in a blue moon you'll include a paper that contains bits of old-fashioned descriptive geology, and I find such papers to be like a breath of fresh air. Something I can read, understand, and actually use! The only trouble is, such papers usually deal with places like Tunisia, Yemen, Oman, or Antarctica. I can't remember the last descriptive paper that dealt with North America. My guess is that you receive such papers, but reject them.

Your magazine, *Geology*, is apparently designed for less technical papers, yet it too seems to be suffering from the quantifying academicians.

Now, there probably should be a journal or two where the pipe-smoking academicians can impress one another with how erudite they are, but I think there should also be a journal or two left where practical papers dealing with geology are published. After all, I'm in this business to find oil, gas, and mineral deposits, and there have been precious few papers in your *Bulletin* in recent years that have ever helped me. This is not true of GSA *Bulletins* published 20 to 30 years ago, as they were loaded with usable contributions.

I'm sure I'm not the first geologist to level such a complaint. My guess is that your files are full of letters of this nature. I'd like to see things ease up a little in your *Bulletin*, and I'd like to see your magazine, *Geology*, be expanded and deal almost exclusively with practical papers which can be understood by every rum-dummy geologist.

Despite the efforts of some academicians to make geology appear to be an "exact" science, it isn't, and never will be. Let's come back to reality!

Yours very truly,
Edgar D. Heylmun, PhD.
Tucson, Arizona

Dear Mr. Heylmun:

. . . I can assure you that I don't reject descriptive papers on North America because of the subject matter.

The papers in the *Bulletin* and *Geology* are unsolicited. If I could get the type of papers you want, I would be most pleased to publish them. . . .

Sincerely,
Bennie W. Troxel
Science Editor

September BULLETIN briefs

Brief summaries of articles in the September 1975 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.*

☐ 50901—Petrology of low-grade rocks of the Gunflint Iron-Formation, Ontario-Minnesota. *R. J. Floran and J. J. Papike, Department of Earth and Space Sciences, State University of New York, Stony Brook, New York 11790.* (22 p., 14 figs., 7 tbls.)

The relatively unmetamorphosed middle Precambrian Gunflint Iron-Formation of Ontario has undergone considerable post-depositional recrystallization and locally intense replacement. Although these tend to obscure primary textural-mineralogical relations, textural elements similar to those of limestone can be identified and their mineralogy defined. Two fundamentally different kinds of iron formation are recognized: (1) cherty iron formation, which consists of granules, ooliths, and interstitial cements; and (2) banded or slaty iron formation, which is composed of matrices (fine-grained internally structureless laminae). Cherty iron formation corresponds broadly to the thick-bedded taconite and algal chert facies of Goodwin; slaty iron formation encompasses the thin-banded chert-carbonate and tuffaceous shale facies.

Greenalite associated with cherty quartz and minor minnesotaite are dominant mineral constituents of granules; stilpnomelane and hematite are less common. Recrystallized calcite, ankerite, and siderite occur locally as cements and as replacement minerals. The most common cement is quartz. Iron silicate and siderite matrices are major constituents of slaty iron formation, which also contains considerable amounts of secondary calcite and ankerite. Stilpnomelane and chamosite are locally abundant in slaty rocks as apparent pseudomorphs after shards.

Microprobe analyses of greenalite reveal little compositional variation; stilpnomelane from slaty iron formation is extremely heterogeneous. Both siderite and ankerite exhibit considerable substitution of Fe by Mg (and Mn locally), whereas calcite is almost pure $CaCO_3$.

Comparison of the greenalite, minnesotaite, and stilpnomelane crystal structures reveals many similarities. The crystal chemistry of magnesium and nickel analogues (serpentine, talc, and garnierite) has been used to predict structural details of the iron-silicate minerals. These are consistent with textural and compositional data supporting a primary origin for the iron silicates. Quartz, recrystallized carbonate cements, microcrystalline siderite, hematite, and possibly magnetite are also considered primary phases.

☐ 50902—Late Holocene paleogeography of the coastal plain of the Gulf of Messenia, Greece, and its relationships to archaeological settings and coastal change. *John C. Kraft, Department of Geology, University of Delaware, Newark, Delaware 19711; George Rapp, Jr., Department of Geology and Geophysics, University of Minnesota, Minneapolis, Minnesota 55455, and Hellenic Institute of Oceanographic and Fishing Research, Agios Kosmas, Ellinikon, Athens, Greece; and Stanley E. Aschenbrenner, Minnesota Messenia Expedition, Department of Geology and Geophysics, University of Minnesota, Minneapolis, Minnesota 55455.* (18 p., 21 figs., 1 tbl.)

The coastal plain of the Pamisos River and five associated rivers at the head of the Gulf of Messenia in the southwestern Peloponnese includes middle through upper Holocene sedimentary-environmental lithosomes of alluvial flood-plain deposits, channel sand, braided streams and deltas, bank swamps and marshes, dune fields, minor lagoons, beach-accretion ridges, and shallow-marine sediment. Radiocarbon and pottery dates, drill cores, outcrops, and environmental studies have provided information for the development of a synthesis of paleogeographic change and its relationship to archaeological remains from the Neolithic period (middle Holocene) to the present. Examples include (1) a marine embayment extended into the area of the present Pamisos River flood plain near the town of Messini in middle-late Holocene (Neolithic-Helladic) time, (2) rounded hills flanking the low-lying Karya River coastal plain were wave-cut cliffs in pre-Roman time, (3) the lower Karya River valley, now occupied by a braided stream, was a swampy lagoonal area, (4) major Early Helladic buildings at Akovitika were constructed along a shoreline, whereas the site is now surrounded by backswamp, and (5) the post-Roman delta-coastal plain of the Tsana River is now undergoing intense erosion. These types of paleogeographic analyses may assist the modern occupants of the coastal area in coastal planning and in understanding rates and nature of coastal change at the head of the Messenian embayment.

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☐ 50903—Cauldron subsidence and fluidization: Mechanisms of intrusion of the Coastal Batholith of Peru into its own volcanic ejecta. *John S. Myers, Geological Survey of Greenland, Østervoldgade 10, Copenhagen, Denmark.* (12 p., 12 figs., 1 tbl.)

The Coastal Batholith of Peru shows how diorite, tonalite, granodiorite, and granite magmas rose through their last few kilometres by a process of magmatic stoping by their fluidized upper surface. The magmas successively displaced both older more basic plutons and their own volcanic debris downward, and came to rest within 3 km of the Earth's surface after loosing volatiles by eruptions through fissures and calderas. There was a continuous association between volcanic eruptions and plutonic intrusions from at least 100 m.y. to 30 m.y. ago in a narrow belt parallel with the continental margin.

The batholith is 50 km wide, more than 1,100 km long, and probably 15 km or less thick. It has steep walls and an extensively preserved flat roof exposed in mountainous desert with relief of 4,500 m. It consists of plutons and sheets which were intruded in five distinct episodes into the same tabular belt by repeated cauldron subsidence. Each subsidence was preceded by the formation of small shear zones which were fractured and fluidized and accompanied by the rise of corrosive, turbulent gas-liquid-solid mixtures. Individual plutons form relatively thin tabular bodies with flat roofs and floors, and steep walls which pass downward into ring dikes and upward into ring dikes and calderas.

☐ 50904—Natural and experimental microstructures in deformed micaceous sandstones. *W. D. Means, Department of Geological Sciences, State University of New York at Albany, Albany, New York 12222.* (9 p., 8 figs.)

Microscopic features associated with cleavage in micaceous sandstone, siltstone, and silty slate include mica films, mica beards, homogeneous distribution of oriented mica, and equant or inequant quartz. These features occur in rocks in a wide variety of combinations. In experiments, somewhat similar microstructures are obtained by slow folding of wet, salt-mica specimens. Points of resemblance between the artifical cleavage and natural examples are the presence of mica films, the axial-plane orientation of the cleavage, convergent and divergent cleavage fans, refraction of cleavage across lithological boundaries, evidence of possible solution effects, and total strains that are broadly similar in magnitude and orientation to strains estimated in rocks with slaty cleavage.

☐ 50905—Paleogeographic and paleotectonic models for the New Zealand geosyncline in eastern Gondwanaland. *Peter M. Austin, Discipline of Earth Sciences, The Flinders University of South Australia, Bedford Park, South Australia 5042.* (5 p., 4 figs.)

New Zealand geosyncline stratigraphy accords with a paleogeographic model whereby late Paleozoic-Mesozoic sedimentation occurred between continental forelands. Such a model fits into a reassembly of eastern Gondwanaland and supports the hypothesis that Late Jurassic-Early Cretaceous tectonism in this region was related to relative motion of the Australian continent.

☐ 50906—Feather River ultramafic body, northern Sierra Nevada, California. *Stephen N. Ehrenberg, Department of Geology, University of California at Davis, Davis, California 95616 (present address: Department of Geology, University of California at Los Angeles, Los Angeles, California 90024).* (9 p., 4 figs., 2 tbls.)

The Feather River ultramafic body is an alpine-type metamorphosed peridotite and dunite with subordinate lenses of mafic schist. The body is located along the northernmost part of the Melones fault zone and is faulted against slate derived from thick mudstone-chert and volcaniclastic-carbonate sequences of Paleozoic and Triassic age.

The ultramafic rock underwent an early episode of high-temperature flowage, probably as a crystal mush, and later was metamorphosed in the greenschist facies, at least in part contemporaneously wih emplacement. Mafic schist in the ultramafic body was metamorphosed under amphibolite- and then greenschist-facies conditions. The western contact of the northern part of the body is a zone of intense shearing and is bordered by a layer 100 to 600 m thick of complexly deformed schist which is intermediate in metamorphic grade between amphibolite and greenschist facies.

☐ 50907—Biogenic sedimentation and alteration of argillaceous sediments in shallow marine environments. *Wayne A. Pryor, H. N. Fisk Laboratory of Sedimentology, University of Cincinnati, Cincinnati, Ohio 45221.* (11 p., 12 figs., 3 tbls.)

The marine decapod *Callianassa major* Say and the marine annelid *Onuphis microcephala* Hartman in shallow marine environments of the southern Atlantic and eastern Gulf of Mexico coasts of the United States produce depositionally significant quantities of argillaceous fecal pellets that are transported and deposited as granular clay with

hydraulically equivalent quartz sand grains. At average population densities observed in shallow marine environments, the organisms are calculated to be capable of removing and pelletizing approximately 12 metric tons of suspended materials per square kilometre per year and deposit fecal pellet mud as thick as 4.5 mm yearly. Recent deposits of *Onuphis* pellets up to 30 cm thick and *Callianassa* pellets as thick as 60 cm have been observed.

The complex, species-specific, sand-sized, fecal pellets are composed of 80 to 90 percent clay mineral particles, 5 to 10 percent undigested organic particles, and small amounts of quartz sand and silt grains. The digestive systems of the organisms significantly alter the clay mineralogy of sediment extracted from suspension, and *Callianassa major* produces fecal pellets of clay-mineral compositions that are different from fecal pellets produced by *Onuphis microcephala.* The digestive processes wholly or partly destroy chlorite. Mixed-layer clay minerals are partly destroyed, and kaolinite and illite are in part disordered. Fecal pellets, rich in organic matter, enter the coprophagic cycle where further alteration takes place. Decay of the organic matter creates microreducing conditions within the pellets, thus promoting the processes of glauconitization.

Whereas flocculation is the important process in the deposition of argillaceous sediment in deltaic environments, biogenic pelletization may be the most important process in depositing argillaceous sediment in shallow marine, interdeltaic environments.

☐ 50908—Rb-Sr data for the older Precambrian rocks in eastern and central Wisconsin. *W. R. Van Schmus, Department of Geology, University of Kansas, Lawrence, Kansas 66045; E. M. Thurman, Department of Geology, University of Kansas, Lawrence, Kansas 66045 (present address: Department of Geology, University of Colorado, Boulder, Colorado 80302); and Z. E. Peterman, U.S. Geological Survey, Federal Center, Denver, Colorado 80225.* (11 p., 10 figs., 2 tbls.)

Rb-Sr geochronologic data, obtained from plutonic, metavolcanic, and metamorphic rocks in eastern and central Wisconsin, are consistent with an *apparent* age of approximately 1,650 m.y. For some samples, the data suggest somewhat older ages. Comparison of the Rb-Sr results with other geochronologic data and recently determined U-Pb zircon ages for some of the same rocks indicates that the 1,650-m.y. apparent age obtained by Rb-Sr methods on rocks from this region does not represent their true age of extrusion or intrusion. Instead, U-Pb data for zircons from these rocks indicate the true ages are in the range 1,800 to 1,900 m.y.

Rocks which yield Rb-Sr whole-rock or mineral isochrons having 1,650-m.y. apparent ages are also found throughout the western Great Lakes area (Michigan, Minnesota, and Ontario), indicating that a widespread, low-grade metamorphic event occurred throughout this region about 1,650 to 1,700 m.y. ago, but no major intrusive or extrusive rocks having true ages of 1,650 to 1,700 m.y. have been found in the region. The bulk of the older Precambrian rocks in Wisconsin are in the age range of 1,800 to 1,900 m.y. old and represent extensive crustal development along the southern edge of the Superior Province during that time.

☐ 50909—Numerical dynamic analysis of quartz deformation lamellae and calcite and dolomite twin lamellae. *John H. Spang, Department of Geology, University of Calgary, Calgary, Alberta, Canada T2N 1N4; Joyceanne Van Der Lee, Department of Geology, University of Calgary, Calgary, Alberta, Canada T2N 1N4 (present address: Department of Geology, University of Toronto, Toronto, Ontario, Canada M5S 1A1).* (7 p., 6 figs., 1 tbl.)

The method of numerical dynamic analysis has been applied successfuly to samples of naturally deformed carbonate cemented sandstone in which the quartz grains exhibit deformation lamellae, and calcite and dolomite grains exhibit twin lamellae. The naturally deformed samples are from the Foothills and Front Range subprovinces of the Canadian Rocky Mountains. In analysis of the quartz deformation lamellae, it is assumed that the plane of the lamellae is a plane of high resolved shear stress, the sense of shear is negative, and the gliding direction is determined from the *c* axis and the pole to the lamellae. Using these assumptions, the existing methods of numerical dynamic analysis and the standard (graphical) dynamic analysis have been applied. Existing graphical techniques for the analysis of deformation lamellae yield essentially the same results as does the technique of numerical dynamic analysis. In this study, the correlation of the principal axes derived from numerical analysis of the quartz, calcite, and dolomite is both internally consistent and consistent with the gelogic framework from which the samples were collected, and it reflects the statistical homogeneity of the stress orientations during the deformation of these rocks. The samples all show a near layer parallel compression of the layer with a range of orientations for the maximum principal stress which agrees well with maximum principal stress orientations calculated from analysis of macroscopic and megascopic structures related to the same thrust.

☐ 50910—Distribution, morphology, and origin of ridges and arches in Mare Serenitatis. *T. A. Maxwell, Department of Geology and Geophysics, University of Utah, Salt Lake City, Utah 84112; Farouk El-Baz, National Air and Space Museum, Smithsonian Institution, Washington, D.C. 20560; and S. H. Ward, Department of Geology and Geophysics, University of Utah, Salt Lake City, Utah 84112.* (6 p., 6 figs.)

Mapping of lunar mare ridges and arches in Mare Serenitatis indicates that several pre-mare impacts in the Serenitatis area may be responsible for the localization of the circular ridge systems and that the subsurface, pre-mare topography is more complex than previously recognized.

Apollo Lunar Sounder cross sections of ridge systems in southern Serenitatis indicate 50 to 100 m of local relief on these features. Ridges in the southwestern part of the basin mark the boundary of a bench 200 m above the local mare level. Arches and ridges are possibly controlled by rings of pre-mare basins resulting from impacts and by a more widespread global stress system. Small-scale features of ridges, such as medial lineations and lobate margins, do not conclusively define the origin of the ridges. However, estimates of crustal shortening from Lunar Sounder data and the coincidence of the major ridge system with the Serenitatis mascon suggest that ridges and arches were formed by gravitational readjustments of the mare fill along four probable impact structures and along a north-trending fracture pattern.

☐ 50911—The PCA 25-foot stand of the sea on Oahu, Hawaii. *Harold T. Stearns, 4999 Kahala Avenue, Apartment 445, Honolulu, Hawaii 96816.* (2 p., 2 figs.)

An ancient calcareous beach deposit is exposed in several quarries on Oahu 25 ft above mean sea level and overlain by reef of the 95-ft stand of the sea of Yarmouth interglacial age. A solution unconformity that separates the two deposits indicates that the sea fell lower than 25 ft after the beachrock was deposited. The 25-ft stand of the sea is named the PCA, from the quarry in which it was discovered.

☐ 50912—Effects of agriculture on erosion and sedimentation in the Piedmont province, Maryland. *John E. Costa, Department of Geography, University of Denver, Denver, Colorado 80210.* (6 p., 5 figs., 1 tbl.)

A study of surficial deposits in the Piedmont province of Maryland has made possible a balanced equation of sediment production and deposition since agricultural land use began in the 1700s. Truncated Piedmont upland soil profiles imply approximately 0.15 m of soil erosion. In a basin of 155 km^2, this amounts to 130×10^{-3} hm^3/km^2 of eroded sediment. Reservoir sedimentation rates imply that 34 percent of the eroded sediment has been carried out of the system. Agricultural sediment stored in flood plains constitutes 14 percent of the estimated soil erosion. The sediment was deposited mostly by overbank deposition at rates as high as 1.6 cm/yr. The remaining 52 percent of the eroded sediment occurs as colluvium and sheetwash deposits on hillslopes and as colluvial-alluvial deposits at junctures of headwater tributaries.

Piedmont basins less than 26 km^2 have statistically longer bankfull recurrence intervals than streams with drainage areas greater than 26 km^2. This suggests that since the decline of agricultural land use in the early 1900s, small upland tributaries have adjusted to decreased sediment loads by erosion of sediment deposited since the initiation of agricultural land use.

☐ 50913—The Reelfoot rift: Reactivated precursor to the Mississippi embayment. *C. Patrick Ervin and L. D. McGinnis, Department of Geology, Northern Illinois University, DeKalb, Illinois 60115.* (9 p., 5 figs., 1 tbl.)

Tectonic elements involved in the formation of the Mississippi embayment, as inferred from geophysical and geological information, originated in late Precambrian time with continental rifting (the Reelfoot rift) and intrusion of high-density magma into the crust. Isostatic subsidence in early Paleozoic time formed the Reelfoot Basin, approximately coincident with the modern embayment, in which sediment several kilometres thick was deposited. Closing of the proto-Atlantic and subduction in the southern Appalachians in middle to late Paleozoic time was accompanied by uplift and widespread erosion in the midcontinent. A period of rift reactivation and intrusion in late Mesozoic time, in association with rapid subsidence in the Gulf of Mexico, prompted renewed isostatic subsidence within the embayment, forming the elongate depositional trough observed today. Seismicity and positive free-air gravity anomalies indicate that isostatic adjustment continues to the present time.

☐ 50914—Mineral reorientation and slaty cleavage in the Martinsburg Formation, Lehigh Gap, Pennsylvania. *Roger C. Holeywell, Department of Geological Sciences, Brown University, Providence, Rhode Island 02912 (present address: Diamond Shamrock Oil and Gas Company, P.O. Box 631, Amarillo, Texas 79173); Terry E. Tullis, Department of Geological Sciences, Brown University, Providence, Rhode Island 02912.* (9 p., 10 figs.)

The outcrop of the Martinsburg and Shawangunk Formations at Lehigh Gap, Pennsylvania, is an important locality for studying the development of slaty cleavage because a gradual transition from shale to slate occurs within a distance of 50 m. In the uncleaved rock in the Martinsburg Formation near the contact with the overlying Shawangunk Formation, white mica is parallel to bedding whereas chlorite is about 20° off bedding. Farther from the contact, a bimodal orientation results from mica becoming oriented parallel to an incipient cleavage, nearly perpendicular to bedding, and chlorite retains its orientation. Farther from the contact, where the cleavage is best developed, the chlorite also is reoriented. The distinct difference in the locations at which these two platy minerals are reoriented argues strongly against their preferred orientations being produced by mechanical rotation of preexisting tabular grains, whether during tectonic dewatering or at high temperatures. Preferred orientation of cleavage appears to be the result of some solution and recrystallization process that is poorly understood.

☐ 50915—Atmospherically transported volcanic glass in deep-sea sediments: Volcanism in subantarctic latitudes of the South Pacific during Late Pliocene and Pleistocene time. *T. C. Huang, N. D. Watkins, and D. M. Shaw, Graduate School of Oceanography, University of Rhode Island, Kingston, Rhode Island 02881 (present address, Shaw: Department of Geology, Brooklyn College, Brooklyn, New York 11210).* (11 p., 7 figs., 5 tbls.)

Particulate separation and analysis of the fine fractions in nine dated deep-sea sedimentary cores reveal very similar time patterns in the accumulation of atmospherically transported rhyolitic volcanic dust during the past 2.5 m.y. The probable source region for the volcanic dust is the Balleny Islands. Simple comparisons of the accumulation-rate curves show that the same series of volcanic eruptions are undoubtedly recorded in the cores examined, for the period of 2.4 to 0.3 m.y. ago. Seven separate periods of intensive volcanic activity, each containing up to eight possibly distinct eruptive episodes, have been detected. The most intense eruptions occurred between 1.8 and 1.6 m.y. ago. The associated volcanic ash will be found in high-latitude marine sediment of the entire South Pacific. The average volcanic dust production rate for the 88 to 11 μm size fraction was of the order of 1.7×10^5 tons/yr over an area of 4×10^6 km^2, for a period of up to 2×10^5 yr.

At most points beyond 500 km from the source, the glass accumulation rates decrease exponentially with increasing distance. An energy equivalent to 20 megatons of TNT is suggested for the maximum explosion for the eruptions. This is about twenty times the energy expended in the 1968 Arenal Volcano eruption, but only 10 to 20 percent of the 1883 Krakatoa eruption.

☐ 50916—Structural patterns in the Southern Appalachian: Evidence for a gravity slide mechanism for Alleghanian deformation. *Robert C. Milici, Tennessee Division of Geology, Knoxville, Tennessee 37919.* (5 p., 6 figs.)

Age relationships of major Southern Appalachian structural blocks, as determined at their intersections, indicate that the older faults of the Alleghanian deformation are to the west and the younger ones are to the east toward the supposed direction of the deforming forces. This break-back pattern of deformation is characteristic of faulting within each block. It is concluded that the final deformation of the Southern Appalachians took place when the Alleghanian thrust sheet moved westward above décollement as a gravity slide, crumpled at the toe, and was faulted in sequence from west to east.

The gravity sliding can be related to vertical uplift of an infrastructural Inner Piedmont mobile thermal core.

☐ 50917—Depositional environment interpretation from settling velocity (psi) distributions. *Walter E. Reed, Richard Le Fever, and Gordon J. Moir, Department of Geology, University of California, Los Angeles, California 90024.* (8 p., 8 figs., 3 tbls.)

Multivariate discriminant function analysis of settling velocity distributions of sand provides a reliable technique for environmental interpretation. We have been able to achieve nearly complete environmental separation by this computational procedure using settling-velocity parameters for 81 sands from desert dune, fluvial, and beach environments. The curve shape of sieved grain-size distributions plotted on probability paper does not appear to be a reliable guide for interpreting depositional environments. Comparison with settling tube data indicates that sieving may distinguish grain-size distributions unrelated to the hydraulic characteristics of sediment and may not distinguish hydraulically important modalities.

Group air fare to Salt Lake City

The Society has made arrangements with Western Airlines to have information on special group fares to Salt Lake City mailed to members.

If you live in the Denver area, you may write to Ms. Lynda Olson, Western Airlines, 8080 Smith Road, Denver, Colorado 80207, for a special convention packet that will contain a return reservation card. Or, you may call Ms. Olson at 398-3450, identify yourself as an annual meeting traveler, and receive information. To obtain information or to make reservations in another area served by Western, you may contact the convention sales representative at the local Western office. The number will be found in the yellow pages.

Many airlines offer group fares from major cities, but the number required to qualify as a group varies. Because no airline serves the entire country, it is impossible to get group fares for all members from one airline. Therefore, if you are interested in organizing a group in your area not served by Western, you are encouraged to call any airline representative near you and inquire about group fares to Salt Lake City.

Paleontological Convention in planning stage

The North American Paleontological Convention II is scheduled for August 8–10, 1977, at the University of Kansas, Lawrence, Kansas. It will be sponsored by the Paleontological Society, the Society of Economic Paleontologists and Mineralogists, the Society of Vertebrate Paleontologists, the American Association of Stratigraphic Palynologists, and the Paleobotanical Section of the American Botanical Society.

The format of the convention will resemble that of the first convention in Chicago, consisting largely of invited papers and symposia. Time and space for meetings of various special interest groups (Friends Groups, working groups, stratigraphically or taxonomically oriented groups) will be provided. In order to keep costs low and to foster interaction, participants will be housed and fed in dormitories. The convention is now in the early planning stage. If you would like to organize a symposium or to suggest a symposium topic, please write now. We shall also appreciate learning which special interest groups plan to schedule meetings. Plans for publication of the symposia are not completed, but the committee reserves first choice at publication. Please address all inquiries to Roger L. Kaesler, Department of Geology, University of Kansas, Lawrence, Kansas 66045.

NSF Chautauqua-Type Short Courses

There will be places for nearly 3,000 college teachers of the natural and social sciences, mathematics and engineering in the 1975-76 program of NSF Chautauqua-Type Short Courses. The program is administered by the American Association for the Advancement of Science. Each of the 38 courses will be offered at either one or two of 14 locations at colleges and universities across the United States.

The objective of the program is to bring to college teachers new information and educational approaches that will be directly useful in their current teaching. There will be a wide range of courses, with emphasis on the relationships between science, technology, and society and other complex problems of an interdisciplinary nature.

Each class will meet in two two-day sessions, the first in the late fall of 1975 and the second in the early spring of 1976. During the interim period, participants will work individually or in small groups on projects related to the courses, and will have an opportunity to exchange results at the spring session.

The NSF provides four nights of lodging on a double-occupancy basis for each non-commuting participant, and an allowance to each Course Director for the procurement of instructional materials. Participants or their institutions pay for travel and meals.

For complete information, write or call Don I. Phillips, NSF Chautauqua-Type Short Courses, Box J, AAAS, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036 (202-467-4468).