GSA news & information

VOLUME 3, NUMBER 5

MAY 1981

GSA EMPLOYMENT SERVICE

Ten years ago GSA started a modest employment program at the annual meeting, originally as a service for students. Since then a similar service has been offered at each succeeding annual meeting. Also, applicant data have been kept on the computer file through the years in order to maintain the service by mail throughout the year.

The service is available at a modest fee to all employers and to any geologist or geology student. Membership in the Society is not a requirement for use of the service.

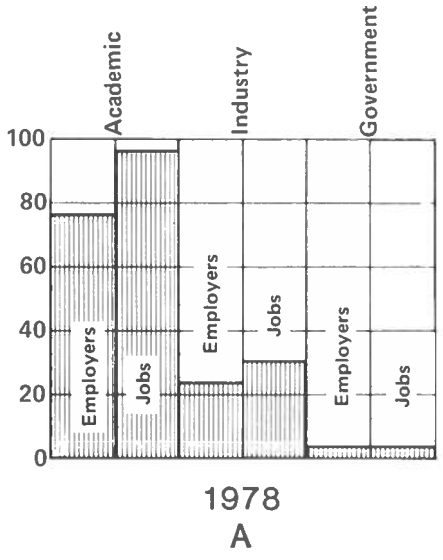
In order to show the volume of activity, graphs A, B, and C indicate the number of employers and job openings in three groupings—academic, industry, and government. It should be pointed out that the largest part of the total each year was in association with the annual meetings. The geographic location of the annual meetings—Toronto in 1978, San Diego in 1979, and Atlanta in 1980—undoubtedly had a strong effect on the "mix" of employers.

The total number of year-round employer users was 47, and 116 used the service at the annual meeting. Approximately 400 applicants are on file.

At the Toronto meeting in 1978, a new aspect of the service was initiated consisting of a "Forum on Future Employment Opportunities." After the meeting the talks were summarized and printed in a small booklet entitled *Future Employment Opportunities in the Geological Sciences.* Both the forum and the booklet were so well received that they were repeated for the 1979 Annual Meeting in San Diego and the 1980 meeting in Atlanta. GSA has printed 4,000 copies of the booklets and will supply them free, while they last, upon request.

The GSA employment service, although still a relatively small program, has demonstrated its value, and the small fee charged covers the cost of its operation.

During the year application forms will appear in *GSA News & Information*. Additional forms and copies of the booklet may be obtained from the GSA Membership Coordinator, P.O. Box 9140, Boulder, CO 80301.



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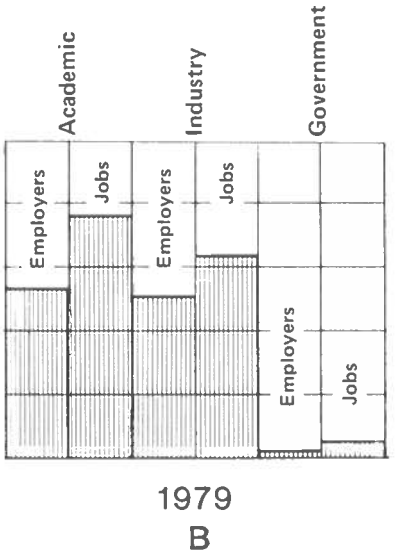

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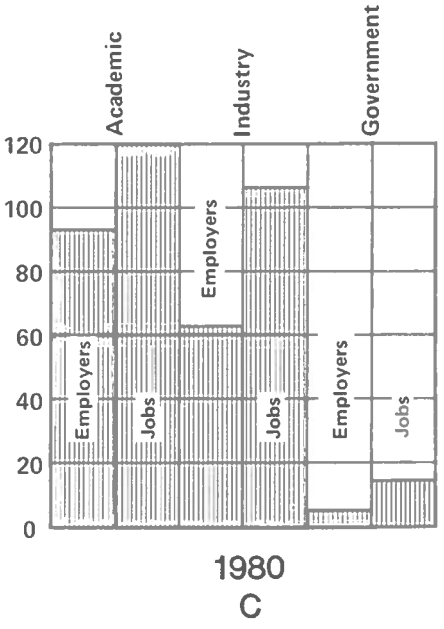

1980
C

PENROSE CONFERENCE

THE ANTARCTIC PLATE: A GLOBAL PERSPECTIVE

A Penrose Conference focusing on the global significance of the Antarctic plate is being sponsored by the Geological Society of America. The conveners of the symposium are Ian Dalziel, Lamont-Doherty Geological Observatory and the Department of Geological Sciences, Columbia University, and David Elliot, Institute of Polar Studies and the Department of Geology and Mineralogy, The Ohio State University. The conference is scheduled for April 11 to 16, 1982, in Shenandoah National Park, Virginia. The conference will last for six days from Sunday (departure from Washington, D.C.) to the following Friday (return to Washington, D.C.).

Antarctica is central to several problems of global geologic significance including (1) processes of continental fragmentation as exemplified by Gondwanaland breakup; (2) the nature and development of the present Antarctic plate; its configuration and interaction with adjacent plates during the late Mesozoic and Cenozoic; (3) the development of Southern Ocean circulation and paleoclimatic change.

The purpose of the conference is to bring together scientists from a wide range of disciplines such as marine geology and geophysics, paleomagnetism, continental tectonics, crustal structure, petrology, oceanography, and biogeography to address these problems.

The registration fee will be between $325 and $350 per person including food, lodging, and transport from Washington, D.C. to Shenandoah National Park and return. It is hoped that partial support will be available for a few graduate students. Attendance will be limited to about 70 persons. Application deadline is November 1, 1981. Those desiring to attend the conference are requested to write to either of the following conveners:

Ian W. D. Dalziel
Lamont-Doherty Geological Observatory of Columbia University
Palisades, NY 10964

David H. Elliot
Institute of Polar Studies
The Ohio State University
Columbus, OH 43210

April *Bulletin, Part II* includes full microfiche maps in negative mode only

The April 1981 *Bulletin, Part II* includes four full-card microfiche, featuring two geologic maps and their accompanying cross sections. These maps are supplied in negative mode only, even if you have ordered the positive mode. (Negative mode has black background with clear lines and text). This applies *only* to full-card maps and cross sections; for the balance of the *Bulletin, Part II,* you will continue to receive the microfiche in the mode which you ordered.

For the extreme reduction factors required in the reproduction of maps on microfiche, we find that the negative mode produces far better detail than the positive mode, which requires an additional generation of photoreproduction.

In addition, many users specify the positive mode to facilitate the use of certain types of microfiche printing devices. Such devices print all the "pages" on a microfiche card, one at a time, and are designed to leave a "border" around each page. On full-card maps significant (and sometimes vital) data occupy these "border" areas which the printers do not reproduce. Thus, it is impractical to use such printers for full-card images.

For these reasons GSA has elected to provide the microfiche in negative mode only.

Negative mode microfiche may be used in any microfiche reader, and enlarged positive prints may be made quickly and conveniently in one step using any 4" x 5" photographic enlarger. Smaller format enlargers may be used, of course, but will require two or more steps. We recommend the use of enlarging papers in contrast grades 3 to 5. In our tests, grade 3 produced a deep black image with no background fogging. We suggest using matte finish paper if the user intends to make marks or notes on the print. Relatively short exposure times will avoid "spreading" of the lines and text which results from overexposure.

GSA welcomes comments on this relatively new technique for the inexpensive production and distribution of large quantities of significant geologic mapping.

Errata for *Initial Reports of the Deep Sea Drilling Project* available upon request

The Deep Sea Drilling Project has completed Errata for Volumes 1 through 44 of the *Initial Reports of the Deep Sea Drilling Project.* Institutions in the United States and IPOD countries that routinely received copies of the *Initial Reports* volumes will automatically receive a complete set of the Errata. Complimentary copies of the Errata are available upon request to all other volume owners. Please specify if you want Errata listings for specific volumes or for the entire set (Volumes 1–44).

Send your request to Science Services, Deep Sea Drilling Project, A-031, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, California 92093.

GSA News & Information
Vol. 3, no. 5 May 1981

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Prepared from contributions from the staff and membership by John C. Frye, Executive Director; James R. Clark, Production Manager; and June Thomas and Ann H. Fogel, Production Assistants.

UPDATE

Articles in *Bulletin, Part II,* May 1981

Articles in *Bulletin, Part II* are listed below. (Summaries only of these articles are in *Bulletin, Part I.*)

1. Geology and petrology of some polymetamorphosed amphibolites and associated rocks in northeastern Taiwan, by J. G. Liou, W. G. Ernst, and Diane E. Moore. (On microfiche: 140 p., 26 figs., 17 tables).
2. Characteristics and origin of Egyptian Younger Granites, by Jeffrey K. Greenberg. (On microfiche: 92 p., 25 figs., 3 tables).
3. Stratigraphy and age of the Chumstick and Wenatchee Formations: Tertiary fluvial and lacustrine rocks, Chiwaukum graben, Washington, by Randall L. Gresens, Charles W. Naeser, and John Whetten. (On microfiche: 36 p., 6 figs., 1 table).
4. Supplementary data for: Structure and petrology of pelitic schist in the Fremont Peak Pendant, northern Gabilan Range, California, by David John. (On microfiche: 7 p., 0 figs., 5 tables).

In May *Geology*

1. Radioactive springs in the watershed of a proposed reservoir in Sequoyah County, Oklahoma: Origin and environmental effect, by S. Bloch, R. L. Craig
2. Mechanics of thrust faulting in crystalline basement, Sevier orogenic belt, Utah, by R. L Bruhn, S. L. Beck
3. Geochemical differences between tropical (Ordovician) and subpolar (Permian) carbonates, Tasmania, Australia, by C. P. Rao
4. Sakami moraine, Quebec: A 500-km-long moraine without climatic control, by C. Hillaire-Marcel, S. Occhietti, J.-S. Vincent
5. Earthquake-dammed lakes in New Zealand, by J. Adams
6. Tectonic segmentation of the northern Antarctic Peninsula, by D. D. Hawkes
7. Coal Creek serpentinite, Llano Uplift, Texas: A fragment of an incomplete Precambrian ophiolite, by J. R. Garrison, Jr.
8. Lower timberline in central Colorado during the past 15,000 yr, by V. Markgraf, L. Scott
9. Lacustrine turbidites in the Green River Formation, northwestern Colorado, by J. R. Dyni, J. E. Hawkins

Necrology

Notice has been received of the following deaths: J Harlen Bretz, Homewood, Illinois; Arne Junger, Santa Barbara, California; W. N. McAnulty, El Paso, Texas; John C. McCampbell, Orlando, Florida; Robert E. Mershon, Littleton, Colorado; John B. Mertie, Rockville, Maryland; Richard M. Pearl, Colorado Springs, Colorado; Olaf N. Rove, Riverside, Connecticut; Van D. Robinson, Houston, Texas; George M. Schwartz, Minneapolis, Minnesota; William Storm, San Antonio, Texas.

CENTENNIAL NEWS

Update on D-NAG project leaders

The roster of primary leadership for the regional synthesis volumes on the Geology of the North American Plate and Adjacent Regions is now complete, except for details of the coverage for Mexico. Additions and changes to the lists published in the November and February issues of *News & information* are given below. In addition, separate volumes on the geology of Greenland will not be possible, but chapters on various aspects of Greenland's geology will be incorporated in appropriate regional volumes.

A final list of the number of volumes in the regional synthesis series will be announced following the April Project Leaders meeting and the subsequent Centennial Steering Committee meeting.

New project leaders

1. **Continental Interior (Canada):**
   J. D. Aitken, G.S.C., Calgary, Alta.
   D. F. Stott, G.S.C., Calgary, Alta.
2. **Mineral Resources of Canada**
   R. I. Thorpe, G.S.C., Ottawa, Ont.
3. **Caribbean Plate**
   Gabriel Dengo, Guatemala City, Guatemala
   J. E. Case, U.S.G.S., Menlo Park, California
4. **Innuitian**
   H. R. Balkwill, Panarctic Oils Ltd, Calgary, Alta.

Changes in project leaders

1. **U.S. Cordillera**
   G. P. Eaton, U.S.G.S., Office of Chief Geologist, Reston, Virginia, replacing R. B. Smith
2. **Precambrian**
   J. C. Reed, Jr., U.S.G.S., Central Environmental Geology Branch, replacing J. E. Harrison

More on D-NAG Workshops

Workshops on "Problems and Perspectives in Regional Geological Synthesis" for Canadian volumes in the D-NAG series on the Geology of the North American Plate and Adjacent Regions will be held at the following times during the Geological Association of Canada meeting in Calgary on May 11 and 12:

May 11 **4:00 p.m.,** concurrent sessions on the Innuitian Orogen, led by H. Trettin, and the Canadian Cordillera, led by H. Gabrielse
4:20 p.m., Mineral Deposits of Canada, led by R. I. Thorpe

May 12 **Poster Session on Quaternary of Canada,** led by R. J. Fulton
5:00 p.m., Precambrian of Canada, led by P. F. Hoffman

REPORT OF THE GSA COMMITTEE ON GEOLOGY AND PUBLIC POLICY

Geological Information—Problems in Transfer from Scientist to Policy Maker

At the Society's 1978 meeting in Toronto, the Committee on Geology and Public Policy sponsored a symposium on "Geological Information–Problems in Transfer from Scientist to Policy Maker." Experts from the United States and Canada were invited to present papers on their experiences. Three categories were included: methods of presenting geological information, the role and experience of scientific advisory groups, and the decision maker's requirements for geological information. The seven papers presented showed a striking diversity of ideas on the methods and problems of data presentation and clearly demonstrated the requirement for geological information in policy formulation in a broad range of contemporary issues.

E. G. Wermund (Bureau of Economic Geology, University of Texas): "Texas Land Resources Mapping for Public Policy Transfer"

J. D. Mollard (J. D. Mollard and Associates Limited): "Examples of Different Approaches Taken When Presenting Geological Information to Different Groups of Policy Makers"

G. A. Robbins, L. A. White, and T. J. Bennett (U.S. Nuclear Regulatory Commission): "Seismic and Geologic Siting Regulations and Guidelines Formulated for Critical Structures by U.S. Federal Agencies"

W. O. Kupsch (University of Saskatchewan): "A Message Garbled"

F. A. Donath (University of Illinois): "The Role of Scientific Advisory Groups: Disposal of High-Level Nuclear Waste"

A. F. Agnew (U.S. Library of Congress): "Decision Making in the U.S. Congress"

H. R. Wynne-Edwards (Alcan International): "Geoscientists in the Decision-Making Process"

Condensed versions of these papers are now available as a Report of the Committee on Geology and Public Policy. Members may receive a complimentary copy by returning the order form below.

Nathaniel W. Rutter
Professor of Geology
Department of Geology, University of Alberta
Edmonton, Alberta T6G 2E3, Canada

Please complete this coupon as your order for the Report of the Committee on Geology and Public Policy entitled *Geological Information–Problems in Transfer from Scientist to Policy Maker.*

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Boulder, Colorado 80301

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REPORT OF THE GSA COMMITTEE ON GEOLOGY AND PUBLIC POLICY
OCTOBER 1980

Perspectives on Government and Science: Occasioned by the Centennial of the U.S. Geological Survey

All agree that modern government requires scientific information—how it gets it, from whom, and how it is used are crucial questions. The GSA symposium at the San Diego Annual Meeting, honoring the USGS on its hundredth anniversary, explored these issues from the viewpoints of the mineral industry, geoscience agencies of government, universities, the Congress, and the observing scientist.

M. Gordon Wolman (Johns Hopkins University): Introduction

E. F. Osborn (Carnegie Institution of Washington; Pennsylvania State University): Dividing responsibilities in scientific research: Government, universities, and industry

W. D. McElroy (University of California, San Diego): University research, innovation, and federal regulations

Digby J. McLaren (Geological Survey of Canada): Earth science and government: A Canadian perspective

J. R. Muhm and P. A. Bailly (Occidental Minerals Corporation): Mining and government in America

George E. Brown, Jr. (Congressman from the 36th Congressional District of California): Geology and public policy

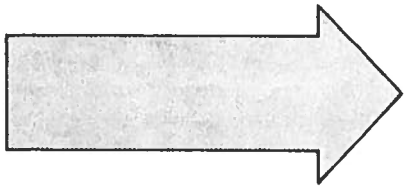
Philip H. Abelson (Editor of *Science*): Science in the Washington jungle

These papers are now available as a Report of the Committee on Geology and Public Policy. Members may receive a complimentary copy by returning the order form below.

M. Gordon Wolman
Professor of Geography

Department of Geography and Environmental Engineering
Johns Hopkins University
Baltimore, Maryland 21218

Please complete this coupon as your order for the Report of the Committee on Geology and Public Policy entitled *Perspectives on Government and Science: Occasioned by the Centennial of the U.S. Geological Survey.*



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COUNCIL ACTIONS, FALL 1980

The following actions were taken by Council during its fall meeting in Atlanta on November 15, 16, and 19, 1980:

1. Received updated reports concerning future plans for the 1988 GSA Centennial and the Decade of North American Geology program.

2. Voted to undertake a Centennial Development fund-raising drive.

3. Discussed mechanisms for including the names of donors in the frontispiece of the Centennial volumes and also listing them in *GSA News & Information*.

4. Established a GSA Foundation and selected the initial board of trustees.

5. Discussed the organizational arrangements of the GSA Foundation; the president of the Foundation will be housed at headquarters; as an employee of the Foundation, the president will be responsible to the board of trustees.

6. Ratified the actions of the Investments Committee taken during its September 25, 1980, meeting in NYC involving the various funds in the portfolio of the Society.

7. Approved financial resolutions concerning changes or additions in check signatories.

8. Selected an additional money manager to handle Society funds in an area not now being covered.

9. Established a special investments fund within the GSA to invest in opportunities not now being tapped by GSA's money managers.

10. Voted to limit the reserve fund to a total of $500,000 at any one time and authorized the controller to make transfers from the reserve fund to the current fund without the written approval of the treasurer to satisfy obligations under the approved budget; withdrawals from the reserve fund will be replenished up to the maximum of $500,000 on a quarterly basis, such actions requiring the written approval of the treasurer.

11. Received and discussed a proposal from the GSA sections concerning the procedure to follow for the selection of councilor-nominees by the GSA Council.

12. Discussed a recommendation from George G. Shor, Jr., to have a dual slate of nominees for councilors on the national ballot.

13. Adopted as the report of Council the *1979 Annual Report of Officers and Committees*, to be submitted to the annual corporate meeting as required by the bylaws.

14. Assigned GSA corporate officers to attend section annual meetings during 1981.

15. Instructed the Executive Director to look into ways of streamlining the corporate meeting.

16. Discussed the invitation from Boston to hold a GSA annual meeting in that city; discussed meeting sites for the 1984 GSA Annual Meeting.

17. Authorized the sponsoring of short courses by GSA at its annual meetings.

18. Discussed surplus of income over expenses at annual meetings; voted that any surplus should be viewed in terms of the needs of the Society in any particular year.

19. Appointed a special Publications Study Committee to investigate thoroughly all aspects of GSA publications and make recommendations for future policies and procedures on editing, publication mode, and marketing; until receipt and acceptance of the committee's report by Council and implementation of new policies, the duties of the science editor would be shared by the Executive Director and an interim editor-in-chief.

20. Discussed publications and staff problems at headquarters.

21. Received the Quaternary Geology & Geomorphology Division resolution concerning the appointment of a geologist as interim science editor.

22. Received the Archaeological Geology Division resolution concerning improvement in the publications department and re-establishing the excellence of the *Bulletin*.

23. Received the Geophysics Division resolution concerning the removal of page limits for publishing papers in the *Bulletin* and retention of *Part II* in microfiche in the interim.

24. Received the report and recommendations from the Program Review Committee concerning the annual meeting technical program, its mechanism, logistics, and relation with the associated societies and GSA divisions.

25. Selected members to serve on the 1981 committees and to be the Society's representatives and designees to non-GSA groups.

26. Discussed and reaffirmed the questions raised by the Committee on Committees regarding: (1) the interlocking membership of the Executive and Budget Committees, and (2) nominations from committee chairmen and from members of those committees should be sent to the CoC in confidence. Nominations should come from individual members and not from the committee as a whole. The latter procedure puts pressure on the CoC to accept the nominations.

27. Penrose Conferences. Discussed prescreening of proposals, guidelines, services of a logistical coordinator, GSA sponsorship, NSF financial support, insurance and administrative costs, cosponsorship with other organizations, and conference fees; approved four Penrose Conference proposals.

28. Discussed the Membership Committee items regarding time limitation for Student Associateship, recruitment, member benefits, reduced preregistration fees for dues-exempt members, employment services, and future employment opportunities forum.

29. Advanced 22 Members to Fellowship and ratified the election of 227 candidates to Membership in the Society.

30. Established a "Letters to the Editor" column in *GSA News & Information*.

31. Accepted the Avis Rent-a-Car discount proposal for GSA members and staff.

32. Discussed total growth in the Society, dropouts, and Members advancing to Fellowship.

33. Received the Publications Committee report and discussed the following: *Bulletin* manuscript flow; possible removal of the page limitation of manuscripts for *Bulletin, Part I;* status, charge, and terms of the standing

(Continued on page 75)

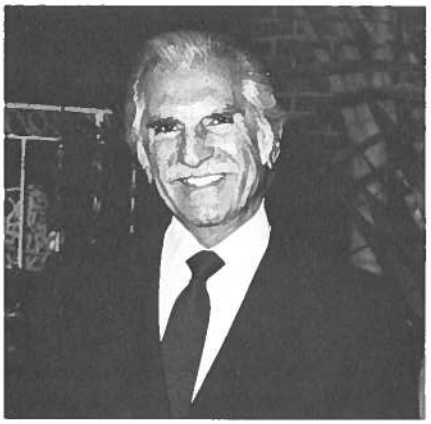
CENTENNIAL DECADE OF NORTH AMERICAN GEOLOGY IS ON THE MOVE!

I strongly encourage all of you to read the following inspiring address delivered at the Geological Society of America Annual Dinner in Atlanta by Michel T. Halbouty, Trustee of the GSA Foundation. His remarks embody the real meaning and significance of the Centennial Decade of North American Geology in a way not given to most of us.

The Decade of North American Geology is indeed one of the most formidable and important projects undertaken by earth scientists anywhere. The results will not only be a major advance in our science, but of great benefit to the countries of North America and to all mankind.

We can all be proud to be a part of it!
Howard R. Gould
President

Centennial Decade: Its Meaning and Significance to Geology



When President Larry Sloss asked me to appear before you tonight, I told him I would be pleased and honored to accept and speak to such a distinguished audience. I debated as to the subject matter of my address, and I considered many, many topics, all of which would give me a lot to say in a short period of time.

This brought to my mind the quote made by the famous philosopher Yogi Berra, who said (and I quote), "Before I say anything, I've got something to tell ya'." And then on another occasion when he was asked to explain why the Mets baseball team did not follow their previous successful season by winning the pennant, this great philosopher replied: "We just made the wrong mistakes!"

You see, it is not a matter of what is said, as much as it is to gain the proper understanding and perspective.

In order to make my point very clear, I would like to relate how a college student sought to help her parents gain proper understanding and perspective. She wrote her parents as follows: "Dear Mom and Dad: I'm sorry to be so long in writing, but all my writing paper was lost the night the dormitory was burned down by the demonstrators. I'm out of the hospital now, and the doctor says my eyesight should be back to normal sooner or later. The wonderful boy, Bill, who rescued me from the fire, kindly offered to share his little apartment with me until the dorm is rebuilt.

"He comes from a good family, so you won't be surprised when I tell you we are going to be married. In fact, you always wanted a grandchild, so you will be glad to know you will be grandparents next month."

Then she added this postscript: "Please disregard the above practice in English composition. There was no fire. I haven't been in the hospital. I'm not pregnant. And I don't have a steady boyfriend. But, I did get an "F" in French and an "F" in chemistry, and I wanted to be sure you received this news in proper perspective. Love, Mary."

I am not here tonight to tell you anything you don't already know. My objective is to review the "known with the knowing" so that we may all pause and reflect on the importance of our profession and of our science of geology to mankind, and I hope that I relate these factors to you in the proper understanding and perspective.

In 1988 the Geological Society of America will celebrate its centennial. From its inception in 1888, the Society has been a respected leader in the many fields of geoscience. From purely theoretical to daily practical applications of geology, its contributions of scientific literature of the highest quality have typified the organization. The free exchange of thought—once unknown in scientific communities—is the standard operating procedure of our Society.

Man today relies more than ever before on the endeavors of our profession for future survival, and the North American Continent has the resources to meet a very large part of those requirements. Greater and more thorough studies of this large land mass and its surrounding waters are sorely needed to establish the productive infrastructure for the future.

Our Geological Society of America is heeding this call for action by planning a far-reaching centennial program that is already in the beginning stages of implementation.

It has been referred to as the "Geological Society of America's Centennial Decade," and its objective is to see its maximum fulfillment at the end of the year 1990.

The principal contribution of the Centennial Program will be a decade of intensive worldwide efforts stimulated and fostered by the Society to further the understanding of the geology of North America.

This will necessitate compiling, updating, and disseminating information we now have and that which we gather that best expresses the geology of the North American continent and the impact of its nature on world needs. The volumes of scientific investigative literature to be produced will be the result of national and international cooperation.

These volumes will include an integrated series of geologic, tectonic, and regional synthesis reports.

Because of the enormity of the program, and the basic fact that the tectonic features of the continent are not constrained by political boundaries, the Geological Society of America has proposed collaboration with individuals and institutions in all of the countries of North America and elsewhere that share the scientific fascination with and practical dependence on the geology of the continent.

Already, many scientific societies have expressed a desire to associate with us in our prestigious and prodigious effort. In particular, I am happy to report that The American Association of Petroleum Geologists has volunteered its vast organization to assist us in our endeavor.

In this regard, the AAPG is sponsoring, preparing, and publishing a revision of the tectonic map of North America which, in itself, is a far-reaching and significant contribution to the Centennial Decade. I am confident that in time many other societies will contribute in some manner to the overall task before us.

As earth scientists, we can feel proud that when this project is completed, it will become an outstanding and lasting contribution to our heritage.

It is also our heritage, which we are all proud to acknowledge, because as geologists our professional heritage has no rival in the spectrum of science. Let us pause and reflect on that heritage.

The story of the Earth, the evolution and destruction of continents, the procession of life which, since the beginning of time, has passed over its surface—these and a thousand closely related themes with which geology treats have attracted countless men to its realm and produced the most interesting record of human endeavor and achievement that can be found in history.

In fact, the very essence of our geologic heritage is the history of its development. In no other discipline are natural historical events more important and vital to the true understanding of geology.

From the beginning, geology has grown and advanced on the balance-scale of probability rather than in the rigid, less flexible framework of mathematics; thus geology always has been an inexact, speculative science.

Commonly suffering from speculation beyond the limits of observation and experience, geological hypotheses and theories have been promulgated and dissipated, but not without some benefit to each succeeding generation of earth scientists.

It is precisely this inexactness of our science that makes it such a great challenge. It takes real courage and discipline to meet this challenge. In this regard, it is part of our professional history that there were many who labored in our science who were maligned and criticized for their observations but who courageously weathered the storm of derision to prove that they were right.

Although their efforts at times were impeded by ignorance and human fallibility, their observations, failures, and successes helped forge the study of the Earth into a fascinating science.

We can even trace recorded observations of nature by Herodotus in the 5th century, and since that time men have searched, probed, and charted the Earth to unlock her past and to record her secrets for the benefit of mankind.

Our early observers of the Earth were called and even referred to themselves as "philosophers of nature," from whence our science of geology developed; and their efforts to prove and disprove their observations and beliefs are legendary.

Thus, the philosophers of nature during the Middle Ages udoubtedly were influenced by the "Aristotelian elements" of fire, air, earth, and water. Werner and the Neptunists and Hutton and the Plutonists gained many of their ideas from the published works of Agricola on mineralogy. They debated their respective philosophies and fought for the minds of their colleagues—each in the belief that they were right.

Each of these men—whether right or wrong—had a heritage upon which he laid the foundation for his own pursuits. These men, their forebears, their colleagues, and their successors all contributed in some measure to our heritage by continuously ferreting out the unknown and adding to the knowledge that we all share today.

The names of other great men of long ago come to mind—men such as John Playfair, James Hall, Robert Jameson, Nicholas Steno, William Smith, Thomas Chamberlin, William Davis, Willard Libby, Norman Bowen, James Walker, and so many more—a roll call so long that no list could ever be completely accurate.

These men—through their discoveries, their mistakes, their confusions, and their solutions—have given to us the total results of their efforts which have added immeasurably to our heritage. Simply, our heritage consists of geologic truths and carries no obligation—except that we carry on from where our predecessors left off.

Thus, there must be a continuum, based on more study, exploration, curiosity, failure, success, and total effort so that we, in turn, may hand down to our geological successors a heritage greater than that which we received.

We must not break the continuum. This is our responsibility to the future of the science of geology and to the peoples of the Earth.

Geology and its associated sciences have continued through the centuries to move forward to serve nations and their people.

In our own country, the greatest single act toward the promotion of geology was the establishment of the U.S. Geological Survey in 1879. Long before that, however, many states had organized and financed state geological surveys, starting with Massachusetts in 1830, but the U.S. Geological Survey was the impetus which gave the science of geology the recognition it justly deserved.

To this day, the U.S. Geological Survey remains the rock upon which our profession continues to build its infra-

structure, and the Survey is also the entity upon which our profession associates itself with a great sense of pride.

It is noteworthy to observe that as the Geological Society of America approaches its centennial anniversary, the U.S. Geological Survey celebrated its 100 years of productive activity last year. The Survey is nine years older than our Society, and the close association and cooperation between the two through nine decades have always been progressive and constructive.

This alliance is more evident today than ever before. The Survey's able director and outstanding geoscientist, Dr. H. William (Bill) Menard, has approved the preparation and publication by the Survey of a remote-sensing land-satellite mosaic map of North America showing the linears and curvilinears of the continent.

This work would represent a most outstanding contribution to our Society's centennial effort. This is a one-kind map that will, through time, be of tremendous value to the scientists of all nations of the continent.

In addition to unlocking many of the geologic unknowns of this large area of the Earth, this significant contribution by the U.S. Geological Survey will be of invaluable benefit to geologists and geophysicists in their endeavors to search for and discover the mineral and energy resources of the future.

The study of the Earth's geology through the eyes of the satellite is but another addition to the progress of our science.

Although the rush of activity that began during the 19th century toward in-depth study of the Earth heralded the beginning of various geoscience fields, it is indeed significant to note that today geology has split into numerous branches of scientific disciplines. Our science has become so diversified that men working in one area may neither know nor understand those who specialty lies in another field.

For this reason, it is even more significant to note that there is no area of human interest where geology does not explore or participate in some manner.

Let us take a look at some of the contributions of our profession's efforts to mankind.

In the fields of energy supply, our profession was responsible for the discoveries of raw energy fuels which have been so important to the progress and prosperity of the world. Based largely on the pioneering of Israel Charles White and a handful of others in the latter part of the nineteenth century, geology has been the foundation of the worldwide search for oil and gas. Petroleum is probably the most dramatic modern contribution of geology to the needs of mankind.

In nuclear energy, itself based on the results of geological exploration for fissionable materials such as uranium, a whole new age of human progress has been opened.

The space program, the most conceptive field of science today, will lean more and more on geology as it progresses. We are becoming more involved in the studies of the other planets, and astronaut-geologists are a regular feature of any space exploration team. Also in the realm of space, programs such as the land-satellite project (Landsat) and the observation satellites for ocean coverage (Seasat) have become invaluable tools in the exploration for various minerals and fuels.

Planned sophisticated satellites—some already designed and some now on the drawing boards—will provide new and unbelievable data which will aid us enormously in our further search for energy and mineral resources from the land and the seas.

Oceanographers have given us valuable information of the seas and more is yet to come. We all agree that the seas make up one of this planet's richest ecological units and comprise scarcely touched reservoirs of resources that will absorb increasing proportions of man's research and development energies for generations to come. These untold stores of minerals and life are already creating far-reaching challenges to the geologists, biologists, and oceanographers.

In association with the paleontologists, we have recorded the age of man and developed a fascinating story of the evolution of all past living things; and, working with the archeologists, geologists have made untold contributions to the culture of the entire world.

We have also been responsible, along with engineers, for the development of major building and construction programs, such as changing the courses of rivers, locating dams, harbors, high-rise structures, housing developments, railroads, highways, sites for new cities, and untold other taken-for-granted activities in the advancement of human progress.

Geologists and seismologists are currently involved in studies of past earthquakes and in seeking criteria for the possible predictions of future earthquakes. This includes the study of the areas most vulnerable to earthquakes and could result in recommendations for the actual removal of major cities or portions of them to other locations where the likelihood of earthquakes would be negligible.

The spreading deserts of the world call attention to the need for protection of crops and grazing lands. As a result of using innovative land designs, new irrigation techniques, and methods of controlling wind damage, much land is now arable and habitable.

The forests of many nations have been depleted by industrialization and natural disasters. This affects the overall agriculture by disrupting soil conditions and water balance. We are now actively involved in reforestation to speed nature's progress in renewing and reclaiming the land.

We are recycling and protecting our planet's most precious resource—water. We have recognized that the world's water is not inexhaustible and that a problem of both the present and the future is how to meet an increasing demand with a limited supply.

We have approached the problem in many ways: cloud seeding to produce rainfall, extracting fresh water from seawater, decreasing evaporation from reservoirs, building strong earthen reservoirs to hold seasonal excesses, and transferring water from one basin to another and storing it in permeable rocks for future use.

Through the use of three-dimensional analysis of ground-water flow, we are controlling subsidence of land areas that until recently were considered unsalvageable.

We are cleaning up our "dead" lakes and waterways and are repopulating them to provide new marine food supplies.

Our industrial wastes are being stored underground to further protect the environment.

We have studied the effect of weather on certain land areas and have established methods to control the erosion and destruction of the land.

All of these activities and many, many more are in

some measure controlled by the proper application of geology. Therefore, it is most appropriate to repeat that there is no area of human interest where geology does not explore or participate in some manner.

Our science is constantly working to understand the needs of mankind and how they can be met. Through the studies of historical and physical geology, through investigations into the many branches of the earth sciences, from the deepest parts of the oceans to the heights of the atmosphere, we are finding clues to the solution of mankind's problems.

We are constantly examining the internal and external phenomena of nature to further adapt the environment to man—to meet his needs and to assure his continued presence upon the earth.

Although all our past efforts required diligent research and careful examination of detail in all areas of geology, we must strive for better understanding of man's future needs and ways of fulfilling these needs.

We are fortunate that we have such a rich foundation upon which to base our studies. Men have gone before us who have lighted the way in unique manners. We have the benefit of the accumulated knowledge of centuries of studies made by dedicated men who were not afraid to question the unknown, men who had the courage of their convictions—the courage to "stand up and be counted" without fear.

The investigation of the North American continent alone is a Herculean task. Covering more than nine million square miles and representing slightly over 16% of the Earth's land area, it poses a formidable challenge to every aspect of geoscience.

The geological endowments of North America cover the spectrum of features of terrestrial continental evolution in space, time, and style.

Its history is a compendium of spectacularly diverse fragments of time, each punctuated by momentous events. Its landscape has been sculptured by a staggering variety of elemental forces. Its mosaic of natural monuments conveys an infinity of moods: awesome like Death Valley, turbulent like the Colorado River rapids, placid like Canada's Athabasca Glacier, luxuriant like the Yucatan jungle, austere like the Dakota Badlands.

Mountain ranges, plains, and lakes stand out as the most obvious aspects of the terrain. Large rivers drain the interior of the continent, carrying sediments to the seas that border it.

The face of the continent today is only the most recent of many profiles the continent has shown since the Earth took shape. Whatever its origins, North America was first a lifeless landmass in the turbulent process of being formed and shaped. Towering mountains were thrust up by volcanic action. The mountains were capped with smoldering craters which spewed torrents of lava.

The crust of the continent cooled and contracted, buckled and buckled again, shifting and lifting mountain spires. Then earthquakes shattered and rearranged the continent. The primal seas washed the surface and hid the landscape.

Throughout the billions of years, the forces of nature continued in restless surges to remold and strip and lift and submerge again the land.

The rainbow of rock stripes in the Grand Canyon marks the passage of time. Billions of sand particles from ancient seas became sandstone layers, mud transformed into shale, and enormous masses of marine skeletons and shells compressed to form limestone. Every color and every layer signify small eternities that mock our conventional calendars.

From the Canadian Shield carved by ice after millenia of folding, faulting, and compression to the Central Lowland of arches and domes, basins and troughs to the Appalachian Highlands uplifted by extensive mountain building; to the soft, young Coastal Plain; and to the rugged Western Cordillera; the face of the continent presents endless opportunities for exploration and investigation.

What happened so long ago is impossible to determine with certainty; the sequence of events and the events themselves are still disputed by scholars and scientists. Time is a tease when it comes to contemplating these events. A thousand years is a fleeting instant, barely worth mentioning. A million years is a brief moment, leaving the barest of legacies.

As I stated in the beginning of this presentation, my intention was to review the known with the "knowing," and what I have just outlined about the continent are things you already know.

In closing, it is noteworthy to observe that what is visible of our continent is awesome in its grandeur, and its unsurpassed surface beauty is challenged only by its geological history. What we have already uncovered of the once unseen has intrigued and amazed both scientist and layman alike. What is still yet to be uncovered will amaze us even more.

Predicting the future is a hazardous game, for it never turns out quite as expected. Nevertheless, I have the firm impression that the advances that will result from such projects promulgated by our Society's Centennial Decade investigation will write remarkable new pages in the history of the geology of the North American Continent.

So when we look back we realize that our heritage is part of a story that is long, varied, and complex—of which only a part has been told—and so much more of it is yet to be told.

As we set forth on our goal to obtain and record more knowledge of the geology of North America, we embark on a new adventure similar to that of those who preceded us.

At the end of our Centennial Decade, after our work has been completed, there should be an improved outlook on the geology of North America. Our new recorded knowledge will help us make better use of this part of the Earth and improve our lot on it.

As students of the Earth, we earth scientists should do everything possible to broaden this knowledge and be part of our Society's centennial efforts. It is a great opportunity for all of us to add immeasurably to our geological heritage, so that those who follow us may have the additional knowledge to improve on the legacy we leave to them.

Reprints of this article are available upon request. Address requests to GSA Production Manager, P.O. Box 9140, Boulder, CO 80301.

(Council Actions, continued from page 70)

Publications Committee; and concern whether the *Bulletin* should be a specific-type or a general-type journal.

34. Voted that manuscripts of up to about 60 pages in length will be accepted for publication in *Part I* of the *Bulletin,* with *Part II* continuing on microfiche for longer manuscripts and for supplemental data for articles in *Part I.*

35. Received the report of the Headquarters Advisory Committee and took its recommendations under advisement.

36. Received the report of the Geology and Public Policy Committee which highlighted the following: plans for the Cincinnati and New Orleans annual meetings, outcome of the Forum on Access held during the Atlanta annual meeting, plans to review and rewrite the two reports from the Panel on Access (No. 1: Federal Public Lands and No. 2: State/Private/Indian Lands) during its March 23, 1981, meeting in Boulder.

37. Revised the *Council Rules, Policies, and Procedures* to reconstitute the Committee on Geology and Public Policy.

38. Ratified the slate for the 1981 Committee on Committees as follows: John O. Wheeler (Chairman), Randolph W. Bromery, Robert D. Hatcher, Jr., Charles J. Mankin, Brian J. Skinner.

39. Appointed the 1981 GSA Auditing Committee as follows: Dallas L. Peck (Chairman), Hubert Gabrielse, Robert D. Hatcher, Jr.

40. Voted to contribute $5,000 for one year as GSA's share of the support of an AGI congressional fellow.

41. Named Howard R. Gould as GSA's member of the AGI Governing Board for the term January 1, 1981, through December 31, 1983.

42. Established a Structural Geology and Tectonics Division within the Society.

43. Approved modifications to various GSA division bylaws.

44. Appointed specific councilors to serve as liaison councilors between the divisions and Council in order to improve communications.

45. Ratified the 1980 Burwell Award winner selected by the Engineering Geology Division.

46. Named a GSA designee to the U.S. National Committee on Tunneling Technology for the term January 1, 1981, through June 30, 1983.

47. Accepted reports from standing committees, sections, divisions, and representatives and designees to non-GSA groups.

48. Reviewed the completed GSA history manuscript received from Edwin B. Eckel.

49. Discussed the awarding of the Penrose and Day medals in alternating years.

50. Voted to cease participation in naming candidates for the Texas Instruments Foundation Founders' Prize.

51. Discussed ways of establishing better communications with the membership.

52. Discussed the nonparticipation of a sitting councilor in Council meetings and activities.

53. Adopted a resolution of thanks to outgoing officers, councilors, committee people, and all those responsible for the successful Atlanta annual meeting; copies will be mailed to all those involved.

54. Set February 4–6, 1981, for the Executive Committee, Investments Committee, and Associated Society Presidents/GSA Executive Committee meetings in Boulder, Colorado.

55. Drew up a list of agenda items for the May 1981 Council meeting.

56. Selected May 18, 1981, for the Executive Committee, Audit Committee, and section treasurer/controller meetings; May 19–20, 1981, for the spring Council meeting, all in Boulder.

57. Took other minor actions, records of which are on file at headquarters.

CENTER FOR FIELD RESEARCH OFFERS FUNDING AND ASSISTANCE

The Center for Field Research offers funding and volunteer assistance to postdoctoral scholars needing support for field research. Working cooperatively with EARTHWATCH, a national volunteer organization, the Center sponsors seventy field research projects each year in the sciences and humanities and in 1981 will send $700,000 and 1,200 volunteers into the field. Proposals for 1982–83 research are now being reviewed.

Eligibility. Qualified projects are reviewed for scholarly merit and their ability to constructively utilize teams of volunteers in the field. EARTHWATCH volunteers, a work force and funding source in one, pay a share of project costs and assist in the field work. For example, a coastal geologist studying barrier island migration needs three two-week teams, of minimum 4 to maximum 10 volunteers each, to assist in sampling and beach profile surveys. If each volunteer contributes $500 toward project costs, a total grant of $6,000–$15,000 is provided.

The Center invites proposals from postdoctoral scholars of all nationalities and is committed to sponsoring the research efforts of qualified women and minority investigators.

Areas of interest. Projects in any recognized academic discipline are welcome, that is, anthropology, archaeology, art history, biology, folklore, geology, marine science, musicology, and zoology. Interdisciplinary proposals are also invited.

How to apply. Submit a two-page Preliminary Proposal outlining your research objectives, project dates, planned use of volunteers, and need for funds. Following favorable review, a Formal Proposal will be invited, which must precede field work by nine months.

For application guidelines and a listing of projects currently receiving support, write Nancy Bell Scott, Center for Field Research, Box 127-BC, 10 Juniper Road, Belmont, MA 02178.

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[1] Please note: in this case, the name is Jean *Mea Culpa*, not Jean Thyfault.

Evidently, from some of the mail I have been receiving, not all of our readers recognized that the first part of our original announcement was taken from a quotation: "Now is the time for all good men to come to the aid of their country."

Perhaps some people did recognize it but disliked my choice.

It *did* capture your attention, which was my whole intent. To all of you who think it an unwise choice– my apologies.

Jean Thyfault

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Term of office: January 1, 1981 through December 31, 1981. Vice-President does not automatically become president.

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NEW GSA PUBLICATIONS

Selected Studies of Archean Gneisses and Lower Proterozoic Rocks, Southern Canadian Shield

Special Paper 182. Edited by G. B. Morey and Gilbert N. Hanson. 1980. v + 195 pages, 113 figures, 76 tables. LC: 80-67113. ISBN: 0-8137-2182-2 . . . . . $26.00

This is a collection of 14 papers on the geology, geochemistry, and geochronology of selected Precambrian rocks of the Lake Superior region. Much has been published about the greenstone-granite terrane, which is typical of the Superior Province of the Canadian Shield. Relatively little has been written about the older gneisses. Discussion of their nature, distribution, and relation to younger Archean and Proterozoic events is a common threat throughout this volume. Seven of the papers provide detailed descriptions of the geology, geochemistry, and geochronology of rocks in the Minnesota River Valley, which is considered to be the type locality for the gneiss terrane. Archean rocks of similar antiquity also have been identified in northern Wisconsin and Michigan by Sims and his colleagues. The results of their studies are presented in the paper by Peterman and others and the paper by McCulloch and Wasserburg. Relations between the ancient gneiss terrane and the younger Archean greenstone-granite terrane—matters of considerable importance to understanding the evolution of the Archean crust—are discussed in a paper by Sims that describes the boundary between the two terranes, mainly in northern Wisconsin and adjoining Michigan.

Much of the earlier Archean gneiss terrane of the region was involved in the Penokean orogeny, a major early Proterozoic tectono-thermal event first documented by Goldich in 1961. The effects of this event greatly complicate geologic and geochronologic studies of the older rocks. The extent to which the Penokean orogeny and somewhat younger events disrupted or reworked the gneiss terrane in central Wisconsin is described in two papers: a geologic analysis by Maass and others and a geochronologic study by Van Schmus. A similar situation involving the reworking of post-Penokean, Proterozoic rocks in northern Wisconsin is documented by Sims and Peterman and alluded to by Doe and Delevaux in their paper on lead isotope investigations in the Minnesota River Valley. All these papers provide additional evidence for the repeated tectonic mobility of the gneiss terrane.

A paper on the geochronology of basement rocks of the Yellow Knife district by Nikic and others that deals with an area far removed from the Lake Superior region is included in this volume because it demonstrates that the ever-less-elusive earlier Archean basement may be widespread in the North American craton.

Although the studies included in this volume advance our understanding of geologic history and crustal evolution in the Lake Superior region, they also suggest many new problems and questions that can be answered only by additional work. The book honors Samuel S. Goldich, whose work has resulted in international recognition both for himself and for the fundamental significance of the geology and geochronology of the Lake Superior region.

Contents: Multiphase deformation in the Granite Falls–Montevideo area, Minnesota River Valley: Robert L. Bauer. Archean rocks of the Granite Falls area, southwestern Minnesota: S. S. Goldich, C. E. Hedge, T. W. Stern, J. L. Wooden, J. B. Bodkin, and R. M. North. Origin of the Morton Gneiss, southwestern Minnesota: Part 1. Lithology: S. S. Goldich, J. L. Wooden, G. A. Ankenbauer, Jr., T. M. Levy, and R. U. Suda. Origin of the Morton Gneiss, southwestern Minnesota: Part 2. Geochemistry: J. L. Wooden, S. S. Goldich, and N. H. Suhr. Origin of the Morton Gneiss, southwestern Minnesota: Part 3. Geochronology: S. S. Goldich and J. L. Wooden. Mineral and rock compositions of mafic enclaves in the Morton Gneiss: Bruce V. Nielsen and Paul W. Weiblen. Lead-isotope investigations in the Minnesota River Valley—Late-tectonic and posttectonic granites: B. R. Doe and M. H. Delevaux. Boundary between Archean greenstone and gneiss terranes in northern Wisconsin and Michigan: P. K. Sims. Tonalitic gneiss of early Archean age from northern Michigan: Z. E. Peterman, R. E. Zartman, and P. K. Sims. Early Archean Sm-Nd model ages from a tonalitic gneiss, northern Michigan: M. T. McCulloch and G. J. Wasserburg. Geology and Rb-Sr age of lower Proterozoic granitic rocks, northern Wisconsin: P. K. Sims and Z. E. Peterman. Penokean deformation in central Wisconsin: R. S. Maass, L. G. Medaris, Jr., and W. R. Van Schmus. Chronology of igneous rocks associated with the Penokean orogeny in Wisconsin: W. R. Van Schmus. Boulders from the basement, the trace of an ancient crust?: Z. Nikic, H. Baadsgaard, R. E. Folinsbee, J. Krupicka, A. P. Leech, and A. Sasaki.

The Scientific Ideas of G. K. Gilbert: An Assessment on the Occasion of the Centennial of the United States Geological Survey (1879-1979).

Special Paper 183—Edited by Ellis L. Yochelson. 1980. viii + 148 pages, 83 figures, 4 tables. LC: 80-67676. ISBN: 0-8137-2183-0 . . . . . $17.00

G. K. Gilbert was a great geologist. His era ended three generations ago, and those who know his name today know little of his life or career and in many cases what he actually did that was so important to the development of geology.

This book aims to rectify that situation by casting new light on Gilbert as a man and as a scientist. It begins with a biographic sketch, taken from a soon to be published biography of Gilbert. In the papers that follow, his contributions to a dozen different topics in geology are considered.

Gilbert's first significant work was with the Ohio Geological Survey, where he studied glacial moraines and ancient lakes. For the rest of his career he was a Federal geologist, going west with the Wheeler Survey and later with the Powell Survey. When the U.S. Geological Survey was founded, Gilbert joined and served under its first four directors; during this time he produced a wealth of seminal papers.

Concepts change as knowledge grows. What did Gilbert contribute? What is the current status of these contributions? Working geologists, all specialists in a variety of subdisciplines, have delved into this fascinating history of ideas. Like the proverbial classic novel "Lincoln's doctor's dog," this collection of essays has something to offer to almost everyone in the earth sciences.

CONTENTS: Preface. 'A great engine of research'—G. K. Gilbert and the U.S. Geological Survey, Stephen J. Pyne. Contributions of Grove Karl Gilbert to glacial geology east of the Mississippi River, George W. White. G. K. Gilbert, on laccoliths and intrusive structures, Charles B. Hunt. G. K.

Gilbert's studies of faults, scarps, and earthquakes, Robert E. Wallace. G. K. Gilbert's Lake Bonneville studies, Charles B. Hunt. Pioneering work of G. K. Gilbert on gravity and isostasy, Don R. Mabey. Gilbert and the Moon, Farouk El-Baz. G. K. Gilbert and ground water, or 'I have drawn this map with much reluctance', Allen F. Agnew. Gilbert—Bedding rhythms and geochronology, A. G. Fischer. Grove Karl Gilbert and the origin of barrier shorelines, John C. Kraft. G. K. Gilbert and the great iceberg-calving glaciers of Alaska, Mark P. Meier and Austin Post. Techniques and interpretation: The sediment studies of G. K. Gilbert, Luna B. Leopold. G. K. Gilbert's geomorphology, Robert J. Chorley and R. P. Beckinsale. Analogies in G. K. Gilbert's philosophy of science, David B. Kitts.

GSA publications released in 1980

Each year we publish a summary of GSA publications released during the previous year. This is done for the convenience of Fellows, Members, and Student Associates who may have missed the numerous announcements published throughout the year in this newsletter, in *Geology,* and elsewhere, and who may not be aware of the number and variety of publications produced by their society. Below is a summary of the publications released during 1980.

Current price lists on all GSA publications are available from the **Publication Sales Department.** Inquiries, orders, and requests for price lists should be addressed to that department at GSA, P.O. Box 9140, Boulder, CO 80301.

BOOK PUBLICATIONS

Memoir 153—*Cordilleran Metamorphic Core Complexes,* edited by Max D. Crittenden, Jr., Peter Coney, and G. H. Davis, 496 p.

Special Paper 181—*Stratigraphy and Glacial-Marine Sediments of the Amerasian Basin, Central Arctic Ocean,* by David L. Clark and others, 64 p.

Special Paper 182—*Selected Studies of Archean Gneisses and Lower Proterozoic Rocks, Southern Canadian Shield,* edited by G. B. Morey and Gilbert N. Hanson, 168 p.

Special Paper 183—*The Scientific Ideas of G. K. Gilbert,* edited by Ellis L. Yochelson, 144 p.

Microform Publication 10—*First Principles of the Science of Mining and Salt Mining,* by F. L. Cancrinus, translated by K. V. Bordeau and Elvi L. Bordeau, 193 p. (2 fiche).

Microform Publication 11—*Precambrian Geochronology of North America, 1951-1977,* by R. G. Vugrinovich, 142 p. (2 fiche)

PERIODICALS

BULLETIN
Part I, 760 p.
Part II, 2,613 p.
Ten-Year Index to Bulletin, 240 p.
GEOLOGY—624 p.
NEWS & INFORMATION—196 p.

MAP AND CHART PUBLICATIONS

MC-28H—Cross Section of the Southern Coast Ranges and San Joaquin Valley from offshore Point Sur to Madera, California, by Donald C. Ross and Davis S. McCulloch (1 sheet, 48½" x 40½", 4 p. text)

MC-28I—Cross section of the central Klamath Mountains, California, by Gregory A. Davis and others (1 sheet, 48" x 30", 6 p. text)

MC-28J—Geologic cross section of the central Oregon continental margin, by P. D. Snavely and others (1 sheet, 34" x 40", 8 p. text)

MC-28K—Geologic cross sections from Patton Ridge to the Mojave Desert, across the Los Angeles Basin, southern California, by J. C. Crowell and others (2 sheets, 36" x 52", text on map)

(Note: The continuing MC-28 series is from Plate Margins Project, U.S. Geodynamics Committee, John C. Maxwell, Reporter.)

OTHER PUBLICATIONS

Abstracts with Programs—six section meetings and one national meeting (563 total p.)

Division newsletters—10 published (92 total p.)

Membership Directory—196 p.

Memorials Volume X—116 p.

Report of the Committee on Geology and Public Policy, *Perspectives on Government and Science: Occasioned by the Centennial of the U.S. Geological Survey,* 24 p.

Miscellaneous materials for Speakers' Packets for annual meeting, 15 p.

REPRINTS

MC-8—Summary sheets of sedimentary deposits, compiled by Darwin R. Spearing (7 sheets, 22" x 36", text on charts)

MC-32—Tectonic Map of South America, published under the auspices of Ministry of Mines and Energy, DNPM, Brazil, and distributed by GSA (2 sheets, 107 p. text)

Memoir 152—*Cenozoic Tectonics and Regional Geophysics of the Western Cordillera,* edited by R. B. Smith and G. P. Eaton, 396 p., plus 8 plates in slipcase

Microform Publication 7—*Interdisciplinary Studies of Peat and Coal Origins,* edited by P. H. Given and A. D. Cohen, 173 p.

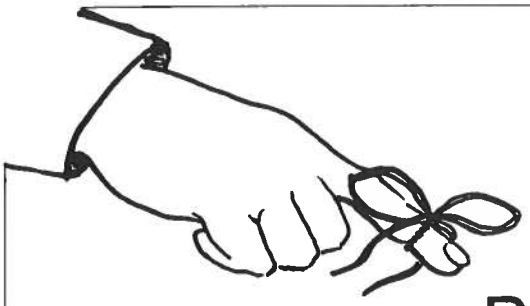
Special Paper 180—*Ash-Flow Tuffs,* edited by Charles E. Chapin and Wolfgang E. Elston, 218 p.

Treatise—Part C, 2 volumes, *Protista,* 933 p.

Treatise—Part H, 2 volumes, *Brachiopoda,* 962 p.

Treatise—Part W, Sup. 1, 1 volume, *Trace Fossils,* 290 p.

Future Employment Opportunities in the Geological Sciences, 15 p.



REMINDER

Deadline for receipt of abstracts at GSA headquarters for the Annual Meeting in Cincinnati is June 5, 1981. Mail volunteered abstracts* to Abstracts Secretary, Geological Society of America, P.O. Box 9140, Boulder, CO 80301 to arrive on or before June 5.

*Abstract forms available upon request from the above address.

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