

## Council Lists Nominees, Honorary Fellows, Medal and Award Winners

The GSA Council approved at its May 1985 meeting the following councilor nominations, honorary fellowships, medal and award recipients, annual meeting cities and dates, new division officers, and Penrose Conference.

### Nominees for Council

For Councilor (1986-1987) and President (1986)  
*W. Gary Ernst*; Los Angeles, California

For Councilor and Vice-President (1986)  
*Jack E. Oliver*; Ithaca, New York

For Councilor and Treasurer (1986)  
*Robert L. Fuchs*; Denver, Colorado

For Councilors (1986-1988)  
*David L. Jones*; Menlo Park, California  
*C. Barry Raleigh*; Palisades, New York  
*E-an Zen*; Reston, Virginia  
*Mary Lou Zoback*; Menlo Park, California

### Honorary Fellowships

*Mircea Sandulescu*  
Institute of Geology and Geophysics  
Bucharest, Romania

*Krzysztof Ludwik Birkenmajer*  
Institute of Geological Sciences  
Polish Academy of Sciences  
ul. Senacka 3, 31-002 Krakow, Poland

*Martin F. Glaessner*  
Department of Geology  
University of Adelaide  
Box 498, G.P.O.  
Adelaide, South Australia 5001

### *Henno Martin*

Geologisch-Palaeontologisches Institut  
Goldschmidtstrasse 3  
D-3400 Gottingen, West Germany

### Medal and Award Winners

#### Penrose Medal

*Rudolph Trümpy*  
Geologisches Institut  
ETH-Zentrum, Zurich CH 8092  
Switzerland

#### Day Medal

*J. Freeman Gilbert*  
Scripps Institution of Oceanography  
University of California, San Diego  
La Jolla, California 92093

Archaeological Geology Division Award  
Not available at press time

Gilbert H. Cady Award (Coal Geology Division)  
Not available at press time

E. B. Burwell Award (Engineering Geology Division)  
Not available at press time

George P. Woollard Award (Geophysics Division)  
*Charles L. Drake*  
Department of Earth Sciences  
Dartmouth College  
Hanover, New Hampshire 03755



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## Council Lists Nominees

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### History of Geology Division Award

*Cecil J. Schneer*

Department of Earth Sciences  
University of New Hampshire  
Durham, New Hampshire 03824

### O. E. Meinzer Award (Hydrogeology Division)

*John A. Cherry*

Department of Earth Sciences  
University of Waterloo  
Waterloo, Ontario, Canada N2L 3G1

### G. K. Gilbert Award (Planetary Geology Division)

*Walter Alvarez*

Department of Geology and Geophysics  
University of California at Berkeley  
Berkeley, California 94720

### Kirk Bryan Award (Quaternary Geology & Geomorphology Division)

No award to be given in 1985

### Structural Geology and Tectonics Division Best Paper Award

Not available at press time

## Future GSA Annual Meeting Dates

1985	October 28-31	Orlando
1986	November 10-13	San Antonio
1987	October 26-29	Phoenix
1988	October 31-November 3	Denver
1989	November 6-9	St. Louis
1990		San Diego

## Officers of Newly Formed Sedimentary Geology Division

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ESS-2, Mail Stop J-978, Los Alamos National Laboratory,  
Los Alamos, NM 87454; (505) 667-4580

Second Vice-Chairman: *Lee J. Suttner*

Department of Geology, Indiana University, Bloomington, IN  
47401; (812) 335-4957 (direct), (812) 335-5582 (dept.)

Secretary-Treasurer: *Robert H. Osborne*

Department of Geology, University of Southern California,  
University Park, Los Angeles, CA 90089; (213) 743-2717 (dept.)

## Penrose Conference

### *Miocene Reconstruction of Southern California*

May 23-30, 1986 (tentative dates)

Conveners:

*Peter W. Weigand*

Department of Geological Sciences, California State University,  
Northridge, CA 91330; (818) 885-3541

*A. Eugene Fritsche*

Department of Geological Sciences, California State University,  
Northridge, CA 91330; (818) 885-3541

*Roy K. Dokka*

Department of Geology, Louisiana State University, Baton  
Rouge, LA 70803; (504) 388-3353

*Judith Terry Smith*

1527 Byron Street, Palo Alto, CA 94301

## Cordilleran Section Names 1985-1986 Officers

At its 1985 annual meeting, May 8-11, GSA's Cordilleran Section elected the following officers for 1985-1986.

Chairman: *Richard L. Armstrong*, Department of Geological Sciences, University of British Columbia, 6339 Stores Road, Vancouver, B.C., Canada V6T 2B4; (604) 228-6208 (direct), (604) 228-2449 (dept.)

Vice-Chairman: *J. Lawford Anderson*, Department of Geological Sciences, University of Southern California, Los Angeles, CA 90089; (213) 743-2277 (direct), (213) 743-2717 (dept.)

Secretary and Accounting Officer: *Bruce A. Blackerby*, Department of Geology, California State University at Fresno, Fresno, CA 93740; (209) 294-2955 (direct), (209) 294-3086 (dept.)

Past-Chairman: *J. William Schopf*, Department of Earth & Space Sciences, University of California, Los Angeles, Los Angeles, CA 90024; (213) 825-1170 (mornings), (213) 825-3505 (afternoons)

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# The Decade of North American Geology **DNAG**

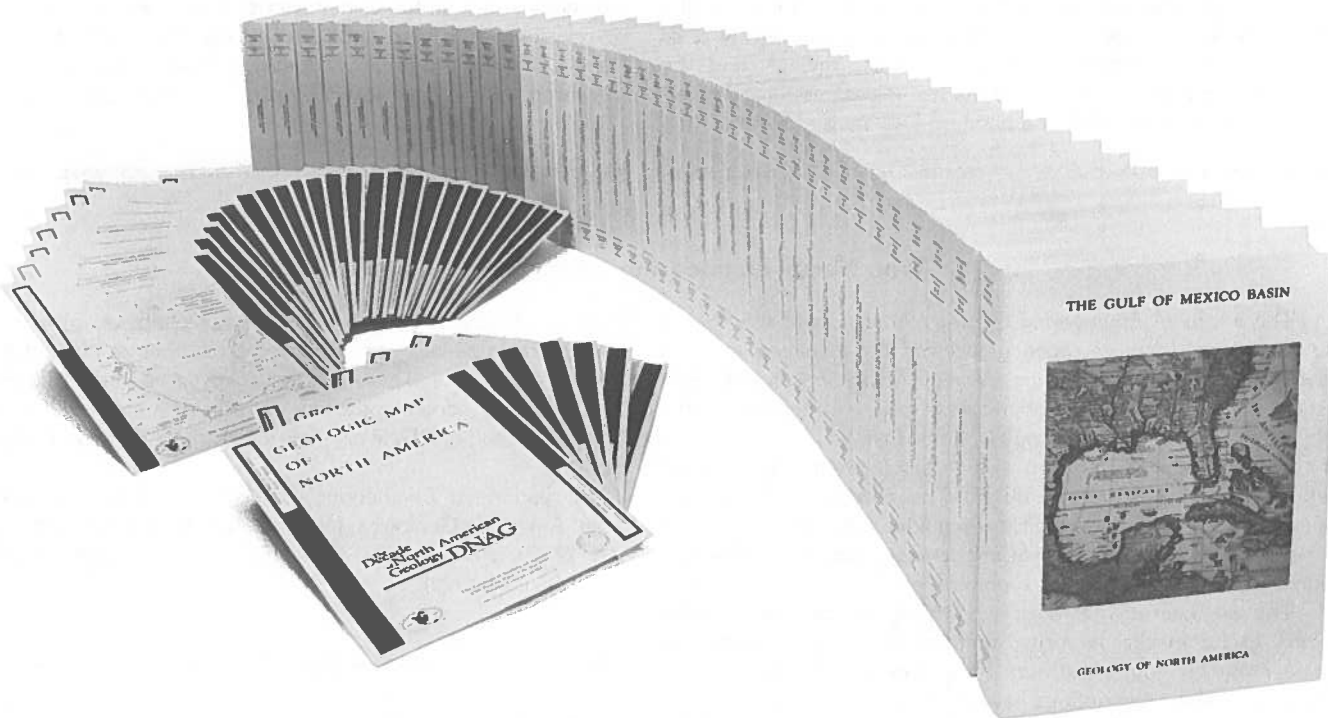
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Publications begin arriving this fall!

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Watch for your personal prospectus coming in early September describing this new synthesis of the geology of North America and adjacent ocean regions.

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The Decade of North American Geology (DNAG) publications will include 28 volumes of geology, 6 field guides, 4 special volumes, 23 continent-ocean transects, and 7 continent scale geologic maps of North America. The project is sponsored by the Geological Society of America to celebrate its centennial decade, 1980-1989. Publications will appear throughout the decade.



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(continued from p. 105)

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Barbara Castens Seidell  
C. David Senor

Allen M. Shapiro	Chris A. Stamm	*Brodie Thompson	*Lisa T. M. Vomero	Van S. Williams
Stephen E. Sharp	Scott D. Stanford	Geoffrey Thompson	Kathleen D. Wahlberg	*Chris J. Wills
Stephen A. Shaver	William D. Stanley	Graham R. Thompson	Phillip Walford	*Melissa C. Winans
*Jesse A. Shell	Robert J. Stechmann, Jr.	Marvin B. Thompson	Charles T. Walker	Harry L. Windecker
Alamin A. Sherif	David Dean Steffe	Linda C. Thurn	Donald P. Walker	Cornelis Winkler III
*Christopher R. Sherwood	Carol L. Stein	Nicholas H. Tibbs	*Richard J. Walker	Kyaw Winn
Der-Duen Sheu	Stephen C. Steinke	David D. Tillson	Philip J. Walsh, Jr.	Don Winston
*Kenneth A. Shimko	Linda Raine Sternbach	*Albert M. Tonn	Joseph H. Waring	Joseph R. Winston
*Craig A. Shoemaker	Jeffrey N. Sternfeld	Richard T. Traub	*Michael R. Waters	Joan I. Winterer
Thomas C. Shrake	Donald A. Stevenson	Sergio A. Trelles Monge	*David K. Watkins	*Thomas W. Witner
Fred H. Shrimmer	Mark T. Stewart	James H. Trexler, Jr.	Eugene T. Watson	*Christopher Wnuk
*Albert W. Shultz	*Paul Stone	John William Trimble	Raymond D. Watts	Margaret S. Wong
*David M. Side	Mavis Z. Stout	Marek Truchan	*Jack D. Weaver	*Karrie Champneys Wood
John D. Sievers	*R. Thomas Strain	Robert T. Turner	C. Penny Webster-Scholten	John W. Woodruff
*Virginia B. Sisson	Richard G. Stromberg	Zane H. Tuta	Mark F. Weider	Michael S. Woodruff
Mary Alice Sjoberg	John O. Sturman	Kyle T. Tyler	Miriam W. Weil	*Madison T. Woodward III
Bruce D. Smith	*Arnon Sugar	Hansa D. Upadhyay	*David S. Weiss	Rosemary L. Workman
Chris Smith	*Kathleen Sullivan	*Stephen J. Urbanik	*Steven I. Weiss	Nicholas A. Woutas
Jennifer M. Smith	Chester L. Summers	*Stephen F. Urschel	Alan H. Welch	Tsai-Way Wu
J. Leslie Smith	Marjorie L. Summers	James W. Vallance	John B. Weldon, Jr.	Tom A. Wursthorn
*Marcia A. Smith	*Albert Y. Sun	*Stephen R. Van Horn	*Ray J. Weldon	Richard N. Yeager
*Richard D. Smith	*Kent A. Sundell	James V. Vantine	Jack G. Wells, Jr.	*Cindy A. Yeilding
Richard P. Smith	Berry Sutherland	*Scott Van Valen	Neil A. Wells	Joe C. Yelderman, Jr.
Ron L. Smith	Tone Svestad	Peter Van Valkenburg	Timothy P. Whitacre	Jay R. Yett
Martha S. Snow	Kevin D. Svitana	*Ana G. Vargo	Christopher E. White	Shozo Yokoyama
Constance P. Sobczyk	Joe Sweeney	Renee L. Varin	Elijah White, Jr.	Shizuo Yoshida
Kristian Soegaard	Barney J. Szabo	*George Vassilev	*Russell D. White	*Michael A. Young
Richard H. Spindler	Brent J. Tardif	*Danny M. Vaughn	William D. White	Robert J. B. Young
John F. Spletstoesser	Nancy K. Teaford	Andrew J. Verdon, Jr.	Steven C. Whitney	Alv Dan Youngberg
William A. Spong	James E. Templin II	Peter Verrall	*Edith M. Wilde	Steven P. Yurkovich
Charles W. Sprague	*Jeffrey H. Tepper	Livio Vezzani	*David L. Williams	Kim Zauderer
Ramaswamiah Srinivasan	Marycarol E. Testi	Alain Villien	E. Ruth Williams	*Sandra Arlene Zelen
Thomas M. Staatz	Bruce J. Thomas	*Timothy J. Vogt	James F. Williams	Susan A. Zerwick
Gerald E. Stachura	James M. Thomas	Catherine Willett Voight	Martin A. Williams	
John S. Stackelberg	Sherri B. Thomas	*Richard A. Volkert	*Nancy Susan Williams	

## NEW GSA FELLOWS

The following candidates were elected to Fellowship by Council action at the May 1985 meeting.

Katherine J. Beinkafner	Howard C. Brooks	Paul F. Hoffman	Paul A. Manera	Robert G. McWilliams
Jonathan H. Berg	Heinz H. Damberger	Andrew J. Hynes	Walter L. Manger	Herman S. Muskatt
Shelby J. Boardman	Jen-Ho Fang	Dennis V. Kent	Ronald W. Marrs	Allan M. Thompson
Rena Mae Bonem	E. Wesley Hildreth	Daniel H. Knepper, Jr.	James A. McCarthy	Ronald R. West

## NEW GSA STUDENT ASSOCIATES

Listed are 1,155 Student Associates who became affiliated with the Society during the period from September 1, 1984, through January 31, 1985.

Dawn R. Ackerman	Ricardo Arango	Lorie Ann Baker	Gray Edward Bebout	Cynthia L. Benson
Mark J. Ader	Dean N. Argenbright	Patrick S. Baker	Richard A. Beck	Susan A. Benson
Daniel C. Alexander	Richard A. Armin	Robin Masuko Baker	Nancy Beckvar	Kathi K. Beratan
Joanne M. Alexandrovich	James E. Arnold	Gail I. Bakker	Theodore E. Bedell III	Linda R. Berckhan
Salah A. Al-Khribash	Kenneth E. Ashton	James D. Balcer	Sheila M. Bednarski	Brent D. Bergen
Charlotte M. Allen	Claudia T. Assini	Richard J. Baldwin	Jerry P. Bedrij	Paul M. Berger
Mark J. Alpert	H. Clay Atchley	Jay L. Banner	Christina B. Behr	Louis K. Bergeron
Sungat R. Altis	Paul J. Atelsek	Gail M. Banwell	Philip J. Beilin	Lawrence M. Bernstein
Allen V. Ambrose	Teresa M. Atwill	Jarrall A. Barnett	Michael J. Bell	Paul S. Bernstein
Arlene V. Anderson	A. John Avakian	Don S. Barrie	Brian J. Bellis	Thomas S. Berquist
Deborah K. Anderson	Bowen J. Aylsworth	Louis R. Bartek	Michael A. Belowich	Susan M. Berta
I. Carl Anderson	Stephen O. Babalola	Wendy L. Bartlett	Frank W. Benacquista	Erick A. Bestlaud
Laurie C. Anderson	David S. Babcock	Timothy E. Bates	Lee E. Benda	Tapas Bhattacharyya
Paul G. Anderson	Jeffrey Lee Bachhuber	Paul D. Beach	Edward Erik Bender	Carol J. Bibler
Richard A. Andre	David B. Back	Katherine A. Bean	Gary A. Bender	Frank R. Bickner
Irvine R. Annesley	Barbara L. Bagby	John E. Beane	Sandy L. Benekas	Scott A. Bigley
David R. Annis	Robert A. Baird	Thomas C. Beard	Theodore Y. Benjamin	Richard J. Binder
John A. Anton	Joseph L. Baker	Elizabeth L. Beasley	Keith B. Benn	(continued on p. 108)



**New Student Associates***(continued from p. 107)*

Scott D. Birmingham  
Curtis G. Bisby  
R. Cameron Bivens  
Charles Chavalier Blanchard  
Paul E. Blanchard  
Kathryn L. Bland  
Imogene W. Blatz  
John G. Bloom  
James J. Boardman  
Carolyn L. Boben  
Peter T. Bobrowsky  
David T. Bohl  
John Karl F. P. Bohlke  
Debra E. Bohn  
Kent W. Boler  
Reidar W. Bomengen  
Joseph E. Bonetti  
Linda M. Bonnell  
William J. Boone  
Timothy Hastings Booth  
Lars E. Borg  
Jay Allen Borkland  
Murray C. Borrello  
Ray M. Boswell, Jr.  
Janet Bosworth-Stow  
Annette Winter Bottum  
Shelley June Bougan  
Brent K. Bovee  
Mark R. Bowie  
Steven D. Braat  
John P. Brandon  
Don P. Bransford  
Bruce L. Brasaemle  
Richard B. Bray  
Greg J. Brennan  
Roger C. Brewer  
James R. Breza  
Tania H. Brice  
Dwayne A. Bridges  
Brian S. Brister  
David A. Bristol, Jr.  
Daniel T. Britt  
Pamela Chase Brock  
Frank G. Brockerhoff  
Joy Bronson  
Marc Brouxell  
Donna J. Brower  
Carol C. Brown  
Glenn R. Brown  
Polly L. Brown  
James R. Brownell  
Weston C. Brownlow  
Robert M. Bruce  
Kay D. Bryan  
Karen Kay Bryant  
George W. Buchanan  
Robert Bruce Buchanan  
Stephen N. Buckley  
Grover S. Buhr  
Patricia F. Buis  
Anna V. Buising  
Roman W. Burak  
Geof H. Burbidge  
James W. Burdett  
Donald Galloway Burdick  
Rachel J. Burks  
Laura L. Burnett

Beverly A. Burns  
Christopher A. Burns  
Dale D. Busch  
Ronald Busciolano  
Robert A. Bushart  
Trey P. Butler  
Lori A. Butts  
Robert A. Butts  
Susan R. Calder  
Brian E. Caldwell  
David A. Caldwell  
Mark S. Caldwell  
Kathleen A. Campbell  
Cynthia D. Campisano  
Harris Scott Cander  
Garry W. Cannon  
Susan H. Cannon  
Deborah A. Capaccioli  
Joseph C. Caravella  
Steven M. Carballeira  
Elizabeth A. Cargay  
Cleet F. Carlton  
Stephen M. Carlton  
Eric P. Carman  
Brett D. Carney  
Scott J. Carpenter  
Sharon D. Carr  
William J. Carrigan  
Bruce M. Carswell  
James H. Carter  
Jerome A. Carter  
James M. Carty  
Katherine V. Cashman  
Brian N. Cassidy  
Michael Ray Caudill  
W. Marshall Chapman, Jr.  
Emmanuel G. Charles  
Isabelle P. Chauvot  
Joy C. Chen  
Bryan A. Cherry  
Richard M. Chetter, Jr.  
Yasmine M. Chidiac  
Hue-Chung Chou  
John N. Christensen  
Lindsay G. Christensen  
John M. Chuey  
Edward C. Cifu  
Susan Circone  
Dennis C. Clark  
Douglas H. Clark  
Paul R. Clark  
Remly Paul Clark  
Robert W. Clayton  
Barry S. Cleveland  
Mark A. Cline  
Jay C. Close  
Edward A. Cloutis  
Michael J. Coffey  
Katharine L. Coley  
Gary A. Colgan  
Kenneth F. Collins  
Michael T. Colucci  
Michael C. Comerford  
Steven J. Conley  
Charles B. Connor  
Gregory J. Contaldo  
Edward P. Conti  
Sterling S. Cook  
Jeanne L. Cooper

Reinold R. Cornelius  
John O. Costello  
Elizabeth Jane Coughlin  
Pierre A. Cousineau  
Ellen A. Cowan  
Rachel Cowan  
Ann Marie Cox  
Mark G. Creager  
Robert G. Crisman  
Charles A. Crocetti  
Vincent S. Cronin  
Henry Clay Crow  
Derrick D. Crowther  
Giuseppi Cugno  
Brent J. Cunderla  
Robert T. Cunniff  
Daniel John Cwiertniewicz  
James B. Daily  
Roberta L. Daley  
Kathy J. Danti  
Robert L. Darwin  
Clifton W. Davenport  
Cameron M. Davidson  
Gary F. Davidson  
Marybeth V. Davies  
Christa L. Davis  
George Harold Davis  
Gregory S. Davis  
M. Robert Dawson  
Patty M. Dawson  
Gilles De Broucker  
Paul L. Decker  
Eugene A. Dedick  
Stephen T. Defibaugh  
Elizabeth C. DeJaham  
Karen A. Demsey  
Kristin O. Dennen  
Dana L. Desonie  
Hugh B. Devery  
Rimmer D. DeVries  
Jeffrey A. DeWitt  
Steven L. D'Hondt  
Judith L. Diamond  
James C. Diebold  
Debra A. Dirlam  
George R. Dix  
Douglas W. Dobransky  
David M. Dolberg  
Lisa L. Donaghe  
James P. Dorian  
Paul K. Doss  
Barton T. Douglas  
William P. Dowling  
Lorinda E. Driskill  
Richard A. Dubiskas  
Kathleen B. Dudek  
Toni J. Duggan  
Alan R. Dulaney  
Alexander J. W. Dumez  
Nelia W. Dunbar  
Catherine A. Dunkel  
John F. Dunn  
Catherine A. Dwinell  
Stuart J. Dykstra  
Gary S. Dymesich  
James S. Eblen  
R. Lawrence Edwards  
Michael A. Eger  
Richard L. Ehrman

Daniel M. Eisenstein  
Mark W. Eisner  
Hamdi H. El Farghali  
Robert J. Ellison  
Pamela D. Emmons  
Larry K. Ennis  
Michael V. Enzien  
Gerald A. Epps, Jr.  
Necdet Ergun  
Cheryl L. Erickson  
Carl L. Eriksson  
Bradley G. Erskine  
William A. Espegren  
Linda L. Evanello  
C. Susan Evans  
David B. Evans  
Roger D. Evans  
William J. Evans  
John L. Ezerskis  
John W. Farrell  
Todd C. Feeley  
Robert H. Fehr  
Bradley F. Feilberg  
David S. Felton  
Clark A. Fenton  
B. Scott Ferguson  
Robert A. Ferree  
Valderez P. Ferreira  
Benjamin A. Ferrill  
Sabine C. Feulgen  
John C. Field  
Richard H. Fifarek  
John D. Files  
Jeffrey E. Filkins  
Thomas H. Filley  
David G. Finley  
Carol Finn  
Andrew T. Fisher  
Donald M. Fisher  
William M. Fletcher  
Lillian B. Flick  
Michael H. Flite  
Tim P. Flood  
Joan L. Florsheim  
Beth Ann Flowers  
Paul V. Fluck  
Peter F. Folger  
Sheila M. Fooshee  
Gregory S. Foote  
John R. Ford  
Jonathan M. Forstom  
David A. Foster  
Dwayne E. Foster  
Douglas A. Fox  
Katharine J. Fox  
Susanna Francis  
Stephen B. Freeman  
George A. Freitag  
Allison M. Frey  
Elizabeth A. Frick  
Richard J. Frizzell  
David J. Froehlich  
Donna Martin Frost  
Lynn J. Fryman  
Corey Y. Fullmer  
Clark S. Fulton  
Tanya Furman  
Robert G. Gaba  
Kenneth C. Gaddy

Lisa M. Gahagan  
Carlos M. Galceran, Jr.  
David G. Gallo  
Julie H. Galton  
Susan Garcia  
David A. Gardner  
Kathleen A. Garland  
Welford E. Garner  
William C. B. Gates  
Susan L. Gawarecki  
Aslaug Geirsdottir  
Michael C. Gekas  
Katherine Gelato  
Douglas J. Geller  
Jeffrey P. Geraci  
Michael D. Gerasimoff  
Leslie A. Gergen  
Gregory N. Gerike  
Jeffrey K. Geslin  
David Giacomini  
James C. Gibbeaut  
Deborah J. Gilbert  
Thomas J. Glancy, Jr.  
Craig R. Glenn  
Jean Glenn  
Linda Le Glick  
Emily F. Gloekler  
David L. Goldsby  
Peter M. Goldschmidt  
Abram Goldstein  
Robert H. Goldstein  
David A. Gonzales  
Cecilia M. Gonzalez McHugh  
Robert W. Goodfellow  
W. Gregory Goodwin  
Steven R. Gordon  
Richard M. Gottfreid  
Douglas R. Gouzie  
Samuel W. Gowan  
Madeleine L. Graham  
Charles W. Grant  
Gordon E. Grant  
Jerry W. Grant  
Jeffrey F. Gratz  
Mark R. Graves  
James D. Greybeck  
Robert F. Gribble  
Gary Joseph Griffiths  
Scott D. Griffiths  
Nancy R. Grindlay  
Sarah B. Griscom  
Marilyn A. Grout  
Marty Grove  
Dave Grow  
Paul J. Guerrette  
Robert R. Gundrum  
Leah J. Gundy  
Gary L. Gunter  
Colleen A. Gupta  
Michael V. Guzikowski  
Bradley R. Hacker  
Michael C. Hagood  
James D. Haines  
Bradley S. Hall  
Don L. Hall  
Jack V. Hamilton  
Becky J. Hammond  
Charles M. Hammond  
Velinda Dawn Hansen



William P. Harbert  
Christina Hardy  
Donald A. Harkey  
Mark T. Harms  
Joan Marie Harris  
Myra L. Hart  
Craig S. Hartman  
Ralph P. Harvey  
Michael E. Hatch  
Christopher R. Havlicek  
Jody M. Hawk  
Randall S. Hay  
Rebecca L. Hayden  
Michael J. Hayes  
Robert C. Hays  
Jennifer A. Hayward  
Robert C. Hazlett  
H. Reiffert Hedgcoxe  
Darla J. Heil  
Silvia M. Heinrich  
Kenneth M. Heirendt  
Paul M. Heisig  
Douglas S. Helmke  
N. Gary Hemming  
Robert C. Hendricks  
Sharon L. Henkel  
A. Paul Henry  
Virginia S. Hensley  
Arlene D. Hepworth  
Karen L. Herrington  
Charles D. Herzig  
Mark D. Hess  
Patricia M. Hester  
Michael A. Hettinga  
Charles D. Hewitt  
Catherine J. Hickson  
Gregory P. Hild  
Christopher L. Hill  
Elizabeth Hill  
Julie A. Hill  
Anne V. Hiller  
Douglas L. Hillman  
Scott J. Hills  
Edward J. Hinchey  
Suzanne M. Hinchey  
Paul J. Hirsch  
Toni L. Hirsch  
Joseph M. Hixon, Jr.  
Valerie S. Hobbs  
Joseph S. Hobin  
Erik Hoeholt  
Jeffrey A. Hoffman  
Sarah E. Hoffman  
Grace A. McCarley Holder  
R. Wade Holder  
K. Todd Holland  
James L. Hollenbeck  
Daniel K. Holm  
Rebecca A. Holmes  
Brantley Holt III  
Patricia Honsa  
Karin A. Hoover  
Terrel J. Hopkin  
Ralph L. Hopkins  
Willard N. Hopkins  
Jennifer A. Hopley  
Janet L. Hopson  
Mary F. Horan  
Eric D. Horringa

Dawn L. Horter  
Mary A. Hoskey  
Scott Howard  
Timothy A. Howard  
Fritz A. Hubacher  
Jeff A. Huber  
Michael Robert Hudec  
Mark R. Hudson  
Michael C. Hultgren  
William A. Hultman  
Sharon B. Hunt  
David A. Hunter  
David V. Huntsberger  
Charles A. Hurich  
Hugh A. Harlow  
Dean B. Ingemansen  
Patricia L. Ink  
Jon A. Irvine  
Rebecca E. L. Irving  
Kathleen A. Isaacson  
Marilyn C. Isgreen  
Scott E. Ishman  
Tamara Ivahnenko  
Eve H. Iversen  
Susan D. Ivy  
Steven L. Jackson  
Philip E. Jagucki  
Barbara J. Jakob  
Caroline Jefferson  
Randall W. Jibson  
Craig A. Johnson  
Eric L. Johnson  
Jeffrey S. Johnson  
Kathleen E. Johnson  
Priscilla L. Johnson  
Samuel W. Johnson, Jr.  
Susan Johnson  
Tara Reuter Johnson  
Tim W. Johnson  
William David Johnson  
Mark J. Johnson  
David H. Johnston  
A. Elizabeth Jones  
Eric E. Jones  
F. Ross Jones  
Frederick G. Jones  
Henry D. Jones  
Richard A. Jowett  
Joseph B. Jurinski  
James A. Kalinec  
Stacey Kardonsky  
Charles C. Kavanaugh  
Robert E. Kayen  
Edward B. Keffer III  
William P. Kegley  
James D. Keith  
Timothy J. Kelly  
John A. Kemper  
Robin L. Kent  
Patricia M. Kenyon  
Kimberly A. Kesler  
Eva L. Ketcham  
Richard M. Kettler  
Susan E. Key  
John F. Kiel III  
Randy L. Kilian-Smith  
Katheryn M. Killeen  
Kenneth L. King  
Michael X. Kirby

Harvey M. Klatt  
David W. Klepacki  
Mary Frances Kling  
Mark H. Klitzke  
Julia B. Knight  
John P. Knightly  
Michael Knoper  
Joel M. Knutson  
Janet A. Koehler  
Michael A. Koehn  
Jean-Christophe Komorowski  
Anthony M. Kondrotis  
Kevin D. Koshoshek  
Robert W. Kosiba  
Kyle W. Kothmann  
Robert Y. Koto  
Dale A. Kramer  
David W. Kreighbaum  
Kevin J. Krenik  
Matthew M. Kuchta  
Roger J. Kuhns  
Elizabeth C. Kurzius  
Andy Y. Kwarteng  
Gary J. La Borde  
Alfred J. Lacazette, Jr.  
Shari M. Lallatin  
Larry A. La Mar  
John T. Lambe, Jr.  
Michael S. Land  
Laine A. Landau  
Antonio Lanzirotti  
Daniel M. Lapointe  
James P. Lardie  
John L. Larsen  
M. Michell Lausen  
Richard J. Laux  
Cindy M. Lee  
Carol Kindle Lee-Roark  
Mark R. Legg  
Lee R. Lehtonen  
Daniel P. Leigh  
Dave E. Leppert  
Marjorie E. Levy  
Donald S. Lewis  
Jonathan C. Lewis  
Paul Z. F. Li  
Ellen M. Limburg  
Ping-Nan Lin  
Ronald M. Linden  
Tina W. Lindquist  
Kevin A. Lindsey  
Tracey D. Link  
Joseph T. Lipka II  
Robert J. Liptrap  
Timothy A. Little  
William W. Little  
Ronald J. Litwin  
Richard F. Livaccari  
Stanley D. Locker  
John A. Locklair, Jr.  
Lisa A. Lodise  
Kimball R. Loeb  
Robert D. Loeffler  
James M. Logan  
Samuel J. Longiaru  
Karen M. Love  
Gary L. Lugar  
Gregory R. Lumpkin  
Scott C. Lundstrom

David Lusby  
Rigel L. Lustwerk  
Elizabeth Linfield Lynch  
Gregory Lynch  
Nancy M. Lyons  
G. Paul Mabrey  
Andrew W. Macfarlane  
Thomas L. Mackie  
John A. Madsen  
Francis J. Magilligan  
Shannon A. Mahan  
James B. Mahoney  
Michael P. Maley  
David L. Malmquist  
Genevieve C. Manchester  
Theodore E. Manis  
Alexander W. Mann  
Keith O. Mann  
Jose R. Manrique  
Gene K. Mapes  
Christopher G. Maples  
Julianne Marhoefer  
David B. Markham  
Gregory Thomas Marks  
Walter E. Marley  
Kathleen M. Marsaglia  
Joan Marti Molist  
Gerard M. R. Martin  
Mark W. Martin  
Bruce R. Martini  
Andrew O. Martyniuk  
Martin E. Mastovich  
Joseph F. Matlock  
Renee S. Mauche  
Diana K. Maxwell  
David W. May  
Steven R. May  
Timothy J. Mayotte  
John H. McBride  
Marcie R. McCabe  
Michael McCormick  
James D. McDermott  
David C. McDonald  
Kristine R. McElwee  
Tracy L. McFarland  
Kimberly A. McGeehan  
William C. McGinnis  
Terry G. McGraw  
Allen J. McGrew  
Charlene A. McGue  
Douglas J. McGuire  
Brian E. McGurk  
Margaret H. McHugh  
A. Scott McKay  
Franklin B. McLaughlin III  
Robert G. McLeod  
Eugene L. McLinn  
Matthew R. McMackin  
Timothy P. McMahon  
Karen J. Meador  
Kent E. Meisel  
Keith H. Meldahl  
Reinaldo Mercado  
Paul A. Merewether  
Janis L. Mergele  
Miranne Merritt  
Stephen D. Merwin  
Cheryl L. Metz  
Michael T. Meyer

Jon M. Michels  
Carl J. Michelsen  
Mac Donald J. Millard  
Craig W. Miller  
Dean C. Miller  
Martin G. Miller  
Ralph E. Miller  
Cynthia D. Miller-Corbett  
Jeanne A. Miller-Culhane  
Wendy K. Milne  
Andrew S. Mirkin  
Jeremy N. Mitchell  
Thomas R. Mize  
David C. Mohrig  
Diego I. Mojica  
Cordova J. Molinares  
Lawrence T. Molloy  
Steven C. Monaci  
Sheila A. Monroe  
Homer Montgomery  
Cynthia L. Moore  
James A. Moore  
Barbara A. Moran  
Le Ann K. Moran  
Paul R. Moran  
Sandra L. Morris  
Thomas H. Morris  
Joel L. Morrison  
Robin F. C. Morrirt  
Michael J. Moskow  
James A. Mott  
Deborah L. Motycka  
Charlotte Mougeot  
William C. Moulder II  
Van S. Mount  
James Paul Mucklow  
Eric W. Muehlberger  
Steven A. Muffler  
Steven W. Muller  
Ruth Ann Multhaup  
Daniel F. Mumford  
Josep A. Munoz De La Fuente  
John S. Munsey  
Donald C. Murphy  
Karrie A. Murphy  
Michael J. Murphy  
William J. Murphy  
David W. Murray  
E. Lynne Murray  
Peter S. Mustard  
Gregory P. Meyers  
Sharon A. Meyers  
Timothy C. Myott  
Greg D. Naugle  
David J. Nazy  
Lisa G. Nelson  
Steven E. Nelson  
Linda E. Nemeth  
Charles T. Nestle  
Christine M. Newsom  
Jo Ann M. Nicholson  
Philip J. Nicolay  
Tina M. Neimi  
Phillip D. Noll, Jr.  
Robert W. North  
Jonathan A. Nourse  
Stephanie A. Novak  
Ricky A. Nusz

(continued on p. 110)

**New Student Associates***(continued from p. 109)*

Charles S. Oakes  
Gerald P. O'Bryan  
Joyce M. O'Connor  
John R. Odermatt  
Gregory C. Ohlmacher  
Karol J. Oja  
Jon D. Olander  
Susan J. Olig  
Mark D. Olivares  
Jon L. Oliver  
Timothy J. Olson  
Caron E. O'Neil  
Randall C. Orndorff  
James W. Osborne  
Susan B. Osofsky  
Karl J. Osterbuhr  
Erik John Oswald  
Patrick B. O'Toole  
Thomas L. Owen  
David A. Pace  
Donald Pair  
John R. Paquin  
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Los Angeles, California  
March 25–28, 1986

**ABSTRACT DEADLINE:**  
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Submit completed abstracts to  
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#### **North-Central**

Kent State University  
Kent, Ohio  
April 24–25, 1986

**ABSTRACT DEADLINE:**  
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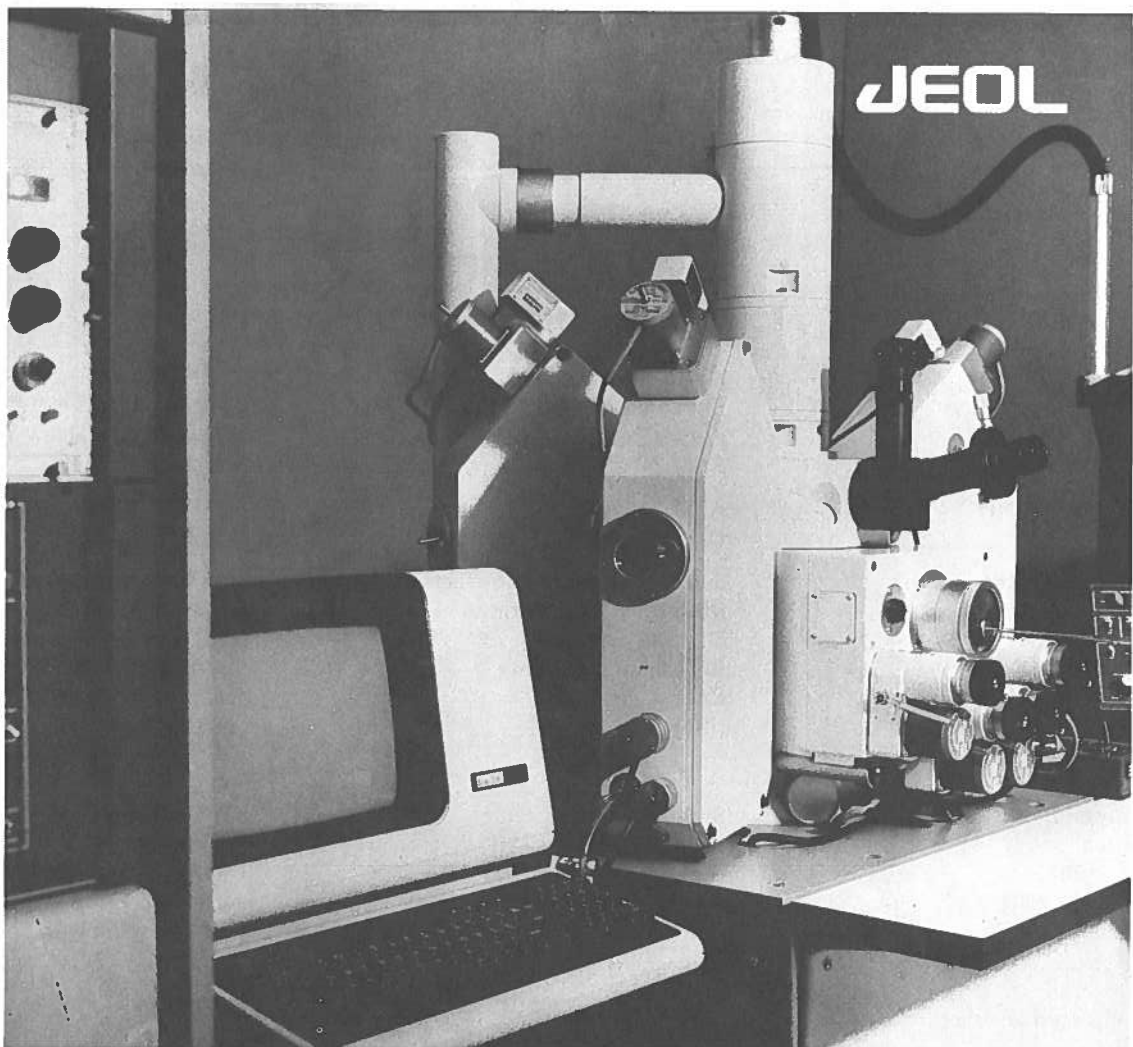
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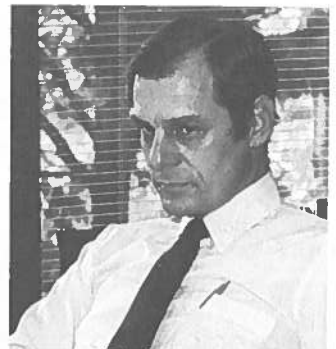




# GSA NEWS & INFORMATION

Monthly Newsletter of  
The Geological Society of America

# 1984 ANNUAL REPORT



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## Report of the

## President

by M. Gordon Wolman

Geology, the *Bulletin*, the Annual Meeting, the Section meetings, Memoirs, maps, Penrose Conferences, and conversation in the halls constitute the visible activities of GSA. Judging from members' comments, even complaints, I have the feeling that GSA is providing many of the services members want in ways that they want them. This is its purpose.

The Annual Meeting at Reno, attended by more than 6,000, broke a record. Attendance at Section meetings throughout the country also remains strong. Indeed, much of the life of GSA is in the Sections. Clearly, the meetings, field trips, and other activities will continue to grow. The Annual Meeting serves a broad audience and should focus on major ideas and exciting frontiers in geology. At the same time, while the Sections too reflect these same ideas, they also deal with the close-at-hand and equally vital issues in a lively and gemütlich atmosphere impossible to achieve in a national meeting. A continuing task is balancing the effort and leading with the strengths of Sections, GSA as a whole, and the associated societies.

The earth sciences are becoming big science not only at the planetary scale but in the oceans, with continental drilling, the handling of large data sets, and sophisticated analyses of micro- as well as macro-phenomena. With big science comes organization, the need for money and sometimes its provision, but much remains for the individual observer at the outcrop. With enthusiasm and not just duty, geologists take on these varying scales. The publications and the meetings of 1984 reflect this diversity and excitement. Membership in GSA is growing (15,450 at the end of 1984) and along with it the demands for more publications and greater diversity among them. The contributions of geology to the public are recognized, and GSA is responding

with public programs related to policy issues at each Annual Meeting. The members, not the Society, have the option of taking positions on major policy issues. GSA, through its Council, does not.

Growth, of course, is not an unmixed blessing. However, we can stand to grow and should. Many geologists have not yet joined GSA. Driven, still, by energy and minerals, and the limited time horizon of society, these are not boom times for the profession. Yet, the science is expanding. To attain their proper role in society the earth sciences need a unified effort at all levels. GSA, with AGI and other scientific societies, is actively seeking to enhance a coherent role for the earth sciences on the national scene.

Many times during my enjoyable year as President of GSA I was asked, "Isn't it a lot of work?" The answer, provided by a colleague, was, "Yes, but most of it is done by the staff." This is true. The lively membership of GSA is blessed by a lively and dedicated staff. They do their best to respond to the diversity of our interests, to anticipate where we are going, and to provide the services we expect—which are always greater than those for which we pay! A myth that dies slowly holds that the staff is large and growing. It isn't—on the contrary, as you have heard before, the full-time staff has gone from 40 to 34 in the past ten years. We will need more if we ask for more services. To reduce costs, the Council has reduced the number of standing committees and the number of Council meetings. The new schedule seems to be working.

I think it has been a good year. At least it looked that way to me. The membership is prickly as ever, and that's as it should be. The future is in good hands. Thanks.





**Report of the  
Executive Director**

by **F. Michael Wahl**

The year 1984 was a good one for the Society and was a period of continued growth and quality development in all areas of operations and activities. Highlights of the year included a successful membership campaign, quality improvements in all categories of our publications program, the largest ever Annual Meeting, in Reno, implementation of a coordinated public relations effort, further computerization of headquarters operations, and reorganization of the administrative department.

Financially, we finished the year in a strong position and showed a gain in the operations category. On the negative side, 1984 was a year in which interest rates remained low, thus diminishing somewhat the return on some of our endowment investments. Much of this, however, was countered by an upsurge in the capital appreciation of our securities as market prices rose near the end of the year.

**Headquarters Staff**

I continue to be impressed with the dedicated service of our headquarters employees and to the way in which they rise to new challenges. Computerization of the headquarters operation continued in 1984. The most significant event was the bringing on line of the accounting function and interfacing it with all other headquarters operations.

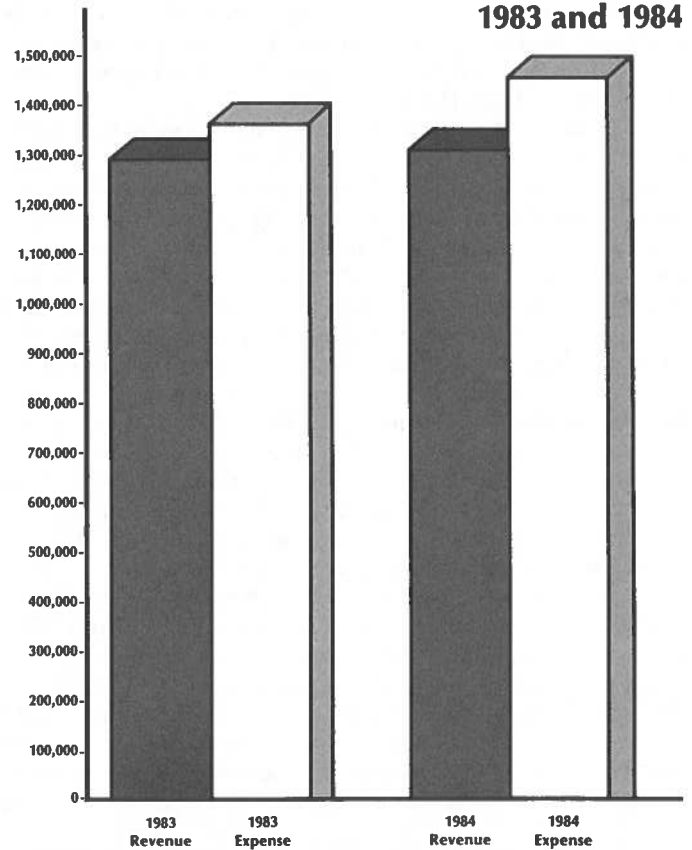
A reorganization of the administrative department took place during the first quarter of the year when one member of my staff was assigned as secretary and assistant to the new director of communications. The number of full-time equivalent employees increased by two during the year as compared with 1983. These two major appointments were Nancy Reed as Director of Communications and Mark Duvall as Manager of Computing Systems. In the editorial department, Faith Rogers was appointed Managing Editor for all GSA publications.

**Publications**

The year 1984 was, again, one of significant changes in the publications of the Society. The *Bulletin* received a new cover layout and design beginning in January, and color was added to the covers of both the *Bulletin* and *Geology* during the year. The total number of science pages published in our monthly periodicals was slightly greater than in 1983, and there was also an increase in the pressruns for the *Bulletin*, *Geology*, and *GSA News & Information* because of increased membership and higher circulation requirements. The editors of the *Bulletin* and *Geology* made several modifications during the year in both format and content of these periodicals as they continued to improve their quality.



**Publications  
Revenue and Expense  
Comparisons  
1983 and 1984**



**New Books and Maps.** Six new books were published, totaling 1,451 pages. This included four Special Papers, one Memoir, and one book in the Engineering Geology series. In addition, seven books, totaling 1,206 pages, were reprinted.

In the *Abstracts* publication program, a total of six volumes were produced for the Section meetings, plus a single volume for the 1984 Reno Annual Meeting. The total of pages for this series was 752. During the year, a total of 163 more abstracts were processed at headquarters than during 1983.

Both revenue and expense figures for the Society's publications program increased during the year as compared with 1983. Revenue received from dues for member periodicals again fell short of actual periodical costs, but revenue received from non-member subscriptions and from increased page-charge contributions showed an increase. As in previous years, the subsidy of member periodical costs from endowment investment income was used to balance the difference between publication revenue and expense.

### Membership

The membership of the Society increased almost 10% in 1984 over comparable figures in 1983. This increase included partial results from a very successful membership campaign. During 1984, we gained the largest number ever of new Student Associate members. We also had the highest retention rate of students transferring to regular membership since 1980, an increase of 15% over 1983. Another notable statistic for the year was a 20% decrease in the loss of Fellows and Members from the Society as compared with 1983. This is a remarkable statistic considering the poor economic conditions that existed in many employment sectors during the year.

The first phase of our membership drive, the "Every-Member-Get-A-Member" campaign, produced a total of 1,453 new applications during the period from September 25 through December 31, 1984. The net effect of the campaign has been a continued increase in the number of applications received monthly.

MEMBERSHIP STATISTICS SINCE 1972

Year	Fellows	Members	Students	Honorary Fellows	Totals
1972	3,293	5,289	873	49	9,504
1973	3,332	5,452	1,871	46	10,701
1974	3,327	5,975	2,917	44	12,263
1975	3,347	6,438	2,224	45	12,054
1976	3,334	6,771	2,377	45	12,527
1977	3,282	6,972	2,095	42	12,391
1978	3,251	7,208	1,903	42	12,404
1979	3,237	7,306	1,874	42	12,459
1980	3,229	7,500	1,834	40	12,603
1981	3,214	7,633	1,828	43	12,718
1982	3,199	7,901	2,243	43	13,386
1983	3,164	7,922	2,871	44	14,001
1984	3,182	8,422	3,713	45	15,362

### Employment Service Program

During 1984 the Employment Service program operated at a level slightly below that of 1983. As may be seen from the accompanying four-year statistical comparison, the total number of employers using the service continued to decrease for the fourth year in a row. The total number of positions advertised also reached a four-year low. There was a small reduction in the number of applicants attending the Annual Meeting and also in the total number of applicants participating in the program. One positive note was a substantial increase in the number of applicants who were employed as a result of participation in the program.

EMPLOYMENT SERVICE STATISTICS

	1981	1982	1983	1984
<b>Employers</b>				
No. of year-round employers	57	43	32	27
No. of Annual Meeting employers	77	41	42	39
Total employers	134	84	74	66
<b>Positions</b>				
No. of positions from year-round employers	57	43	32	27
No. of positions from Annual Meeting employers	165	70	71	61
Total positions	222	113	103	88
<b>Types of positions</b>				
Academic—year-round	19	33	16	9
—Annual Meeting	95	54	50	46
Industry—year-round	32	8	12	16
—Annual Meeting	58	10	8	11
Government and Other				
—year-round	6	2	4	2
—Annual Meeting	12	6	13	4
Total no. of applicants at Annual Meeting	309	263	231	218
Total no. of applicants	474	527	422	404
Total no. of applicant successes (joined year before)	41	22	8	20

### Meetings

The Annual Meeting in Reno was the largest in the history of GSA and was a success in all categories. The total registration of 6,065 exceeded the anticipated attendance by more than 20%. The MGM Grand Hotel was, to say the least, a different type of facility from that in which we normally hold the Annual Meeting. It did, however, provide adequate space, and the audiovisual facilities were the best that we have ever had. A grand total of 1,596 papers were presented in volunteered, poster, and symposia sessions. The number of abstracts volunteered for the meeting totaled 1,824, a 65% increase over 1983.

The 24 field trips attracted 1,010 registrants—again, an all-time high. Preceding the meeting, GSA sponsored four of its own short courses and workshops, plus an additional five pro-



grams sponsored by GSA divisions and our associated societies. The exhibit was also the largest ever and contained a total of 179 booth spaces filled by 131 exhibitors. In the arena of publicity, for the first time GSA drew national news media attention—and did it in the face of the Presidential election.

A total of 4,256 registrants attended the GSA Section meetings during 1984, at which 1,282 papers and posters were presented in 155 half-day sessions. This represented a decrease of 576 papers when compared with 1983 and a 17.6% decrease in the number of half-day scientific sessions.

#### 1984 SECTION MEETING STATISTICS

Section, meeting location	Reported registration	No. of papers presented	No. of half-day sessions
Cordilleran Anchorage, Alaska	1,015 (approximate)	283	43
Rocky Mountain Durango, Colorado	605	181	20
North-Central and Southeastern (joint) Lexington, Kentucky	927	355	35
South-Central Richardson, Texas	414	142	21
Northeastern Providence, Rhode Island	1,295	321	36

#### Penrose Conferences for 1984

The Society sponsored six Penrose Conferences in 1984:

*The West-African Connection—Evolution of the Central Atlantic Ocean and Its Continental Margins*; Conveners: John Rodgers, Xavier T. LePichon, Jean Sougy; Giens, France

*Processes and Products of Multistage Melting and Metasomatism in the Mantle*; Conveners: Jane E. Pike, Arthur L. Boettcher, Frederick A. Frey, Frank M. Richter; Apache Junction, Arizona

*Structural Styles and Deformational Fabrics of Accretionary Complexes*; Conveners: J. Casey Moore, Daniel E. Karig, Darrel S. Cowan; Eureka, California

*Melanges of the Appalachian Orogen*; Conveners: Harold Williams, Nicholas Rast, Brenna E. Lorenz; Stephenville, Springdale, and Gander, Newfoundland

*Geochemistry of the Environment near a High-level Nuclear Waste Repository*; Conveners: David G. Coles, Michael J. Apted, Floyd N. Hodges, Donald H. Alexander; Welches, Oregon

*Transport Processes in Fractured Rock*; Conveners: Leslie J. Smith, Frank W. Schwartz; Park City, Utah

#### Research Grants

The Committee on Research Grants awarded a total of \$92,068 for the support of research in 1984. This sum included \$80,000 from Penrose Endowment income, \$6,500 from industrial donations, and \$1,115 in contributions to the GSA Foundation. Earnings from the Harold T. Stearns Fund and the Arthur L. Day Fund totaled \$4,453. In all, a total of 118 proposals were selected for funding from the 568 proposals received. Of the 118 proposals funded, 73 were for Doctoral research and 45 were for Masters research. The average grant was \$779, and the award rate was 21% of the proposals received.

Recipients of specialized Society awards in 1984 were as follows:

Robert K. Fahnestock Memorial Research Award  
Kathleen M. Farrell, Louisiana State University

Harold T. Stearns Fellowship Awards  
Paterno R. Castillo, Washington University, St. Louis  
Patrick F. Dobson, Stanford University  
Donald M. Fisher, Brown University  
John H. Fournelle, Johns Hopkins University  
Marcy Newton, University of Texas, Arlington  
Elizabeth Wright, Scripps, University of California, San Diego

Gladys W. Cole Memorial Research Award  
William L. Graf, Arizona State University

#### Decade of North American Geology

Development of the volumes, maps, and transects for the Decade of North American Geology (DNAG) continued to progress on all fronts during 1984. Final coordinating conferences were held for seven volumes of *The Geology of North America: Sedimentary Cover of the Craton: U.S.*; *The Appalachian/Ouachita Regions: U.S.*; *The Caribbean Region*; *The Atlantic Continental Margin: U.S.*; *The Gulf of Mexico Basin*; *The Cordilleran Orogen: Alaska*; and *The Cordilleran Orogen: Conterminous U.S.* Chapter texts for these volumes are now being received for peer-review processing and copy-editing. Seven *Continent/Ocean Transects* were in hand and being color separated by the end of the year. Editors for all six *Centennial Field Guides* were receiving texts for the 100 best geologic sites in the areas of their regional GSA Sections. Nineteen chapters for the History of Geology Division Centennial volume *Geologists and Ideas: A History of North American Geology* had been received from the volume editors and were in the copy-editing or typesetting stage. Organizational meetings had been held for compilers of the Stress, Seismicity, and Thermal Aspects maps of North America that are being prepared as a Centennial contribution on neotectonics under the joint auspices of the Geophysics and Structure and Tectonics Divisions.

Funding for all aspects of DNAG through the GSA Foundation continued to be strong. Products should begin to appear in increasing numbers in late 1985.



## Medal and Award Winners for 1984

Penrose Medal: *Donald E. White*  
Day Medal: *Wallace S. Broecker*  
Archaeological Geology Division Award: *C. Vance Haynes, Jr.*  
Gilbert H. Cady Award: Presented biennially, no award in 1984  
E. B. Burwell Award: *Roy E. Hunt*  
George P. Woollard Award: *Manik Talwani*  
History of Geology Division Award: *Mary C. Rabbitt*  
O. E. Meinzer Award: *Franklin W. Schwartz and Leslie Smith*  
G. K. Gilbert Award: *George W. Wetherill*  
Kirk Bryan Award: *Steven M. Colman*  
Structural Geology and Tectonics Division Best Paper Award: *Peter J. Coney, David L. Jones, and James W. H. Monger*

## Honorary Fellowships for 1984

*Huang Jiqing*  
Chinese Academy of Geological Sciences  
Baiwanzhuang Road 26  
Beijing, China  
*Michael W. McElhinny*  
Bureau of Mineral Resources, Geology, and Geophysics  
P.O. Box 378  
Canberra City, A.C.T., Australia  
*Hans Ramberg*  
Division of Mineralogy and Petrology  
University of Uppsala  
Box 555, S-751-22  
Uppsala 1, Sweden

## GSA Committees, 1984

### Executive Committee

M. Gordon Wolman, President and Chairman; Brian J. Skinner, Vice-President; Robert L. Fuchs, Treasurer; Paul A. Bailly, Past-President; Haydn H. Murray, Committee on the Budget Chairman

### Audit Committee

Thornton L. Neathery, Chairman; George A. Thompson, Charles J. Mankin; Conferee: Robert L. Fuchs

### Committee on the Budget

Haydn H. Murray, Chairman; M. Gordon Wolman, Brian J. Skinner, Robert L. Fuchs, Paul A. Bailly; Ex Officio: William B. Heroy, Jr., Chairman, Committee on Investments

### Committee on Committees

Bruce B. Hanshaw, Chairman; J. James Eidel, G. Ross Heath, Elaine Padovani, Raymond A. Price

### Committee on Geology and Public Policy

Priscilla C. Grew, Chairman; James W. Skehan, S. J., Harry W. Smedes, Thomas J. Joiner, Terry W. Offield, Arthur A. Socolow, Michael Churkin, Jr., Vincent Matthews III, James R. Underwood, Jr.

### Headquarters Advisory Committee

Richard F. Mast, Chairman; James A. Drahovzal, Steven S. Oriel, Elizabeth A. Elliott, Jean D. Juilland

### Subcommittee on Penrose Medal Award

Charles J. Mankin, Chairman; Donald L. Everhart, Ursula B. Marvin, Amos Salvador, Hugh P. Taylor, Jr., A. L. Washburn, Gregory A. Davis

### Subcommittee on Arthur L. Day Medal Award

George A. Thompson, Chairman; Susan W. Kieffer, Neil D. Opdyke, Joseph V. Smith, David R. Wones, Richard L. Armstrong, Rob Van der Voo

### Subcommittee on Honorary Fellows

B. Clark Burchfiel, Chairman; Reuben J. Ross, Jr., Campbell Craddock, Troy L. Péwé, Warren B. Hamilton, James L. Wilson

**Treatise on Invertebrate Paleontology Advisory Committee**  
Robert F. Lundin, Chairman; James T. Sprinkle, F. Michael Wahl

### Committee on Investments

William B. Heroy, Jr., Chairman; Walter E. Seibert, Jr., Thomas W. Stern, Anthony Reso, Rosemary J. Vidale; Ex Officio: Robert L. Fuchs, Haydn H. Murray

### Committee on Membership

Marcus E. Milling, Chairman; Aureal T. Cross, Eric W. Mountjoy, Henri E. Gaudette, Donald L. Baars, Donald C. Haney

### Committee on Nominations

Haydn H. Murray, Chairman; James D. Aitken, David E. Dunn, Donald F. Eschman, Thornton L. Neathery

### Committee on Penrose Conferences

Kevin Burke, Chairman; J. Wright Horton, Jr., George W. Viele, Jr., Richard J. Moiola

### Program Review Committee

Haydn H. Murray, Chairman; William A. Craig, David B. Slemmons, James F. Tull

### Committee on Publications

Eldridge M. Moores, Chairman; Maria Luisa B. Crawford, John M. Aaron, Gunter Faure, Robert D. Hatcher, Jr., William A. Thomas, Campbell Craddock, John C. Reed, Jr.; Conferee: F. Michael Wahl

### Committee on Research Grants

Clifford A. Hopson, Chairman; Donn S. Gorsline, James F. Tull; Conferee: James F. Hays

### Committee on Minorities in the Geosciences

Elisabeth C. Schwarzman, Chairman; Charles A. Baskerville, Louis A. Fernandez, David A. Lopez, Clement F. Shearer

### Steering Committee on Decade of North American Geology

Digby J. McLaren, Chairman; Albert W. Bally, Robert G. Blackadar, Gabriel Dengo, Charles L. Drake, Jose C. Guerrero, James F. Hays, Raymond A. Price, John C. Reed, Jr., Guillermo P. Salas, Leon T. Silver, John O. Wheeler; Ex Officio: M. Gordon Wolman, Brian J. Skinner, Robert L. Fuchs, F. Michael Wahl, A. R. "Pete" Palmer, Dwight V. Roberts





## Report of the

### Treasurer

by Robert L. Fuchs

In 1984, as in the previous year, GSA enjoyed improved financial results in all categories. The report of the Society's independent auditors, Touche Ross & Company, including financials for the six GSA Sections indicates total assets as of December 31, 1984, of \$14,138,826, up 11.6% from 1983's \$12,788,368. Liabilities at the end of 1984 were \$1,603,940, resulting in net worth of \$12,534,886, an increase of 7.7% over 1983's net worth of \$11,633,727. The Society's working capital (current assets less current liabilities) increased by 42.6% from \$2,065,772 (restated) at the end of 1983 to \$2,946,002 at the end of 1984.

Revenue and support exceeded expenses during 1984 by \$287,934, essentially flat with 1983. However, investments generated gains of \$591,796, and there were contributions to GSA of \$21,429. As a result, the excess of capital additions, revenue, and support over expenses was \$901,159, up 28.3% from the previous year.

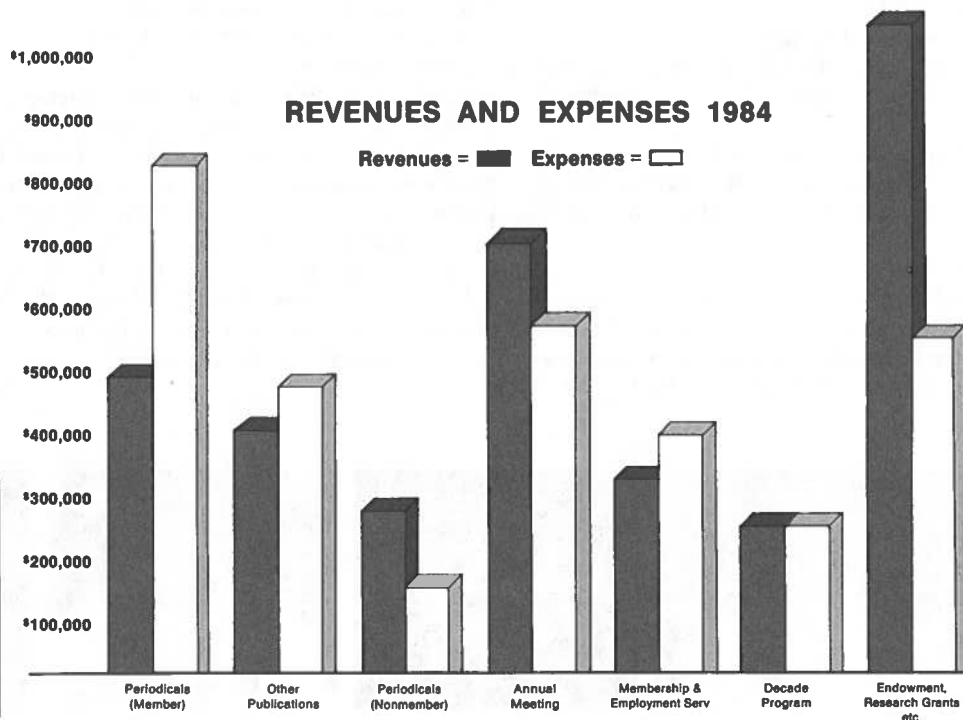
In the accompanying diagram we have allocated revenues and expenses into the appropriate major sectors of the Society's activities. Support is required in Member Periodicals, Other Pub-

lications, and Membership and Employment Service. Support is provided by Nonmember Periodicals, Annual Meeting, and Endowment. Costs of the Decade Program are reimbursed by the GSA Foundation. In this analysis we have placed general and administrative costs in the Endowment category.

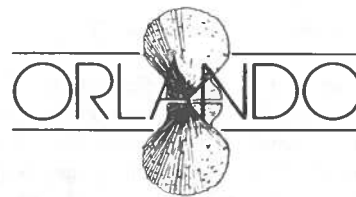
The activities that are subsidized are essentially unchanged from 1983. Of particular significance is the surplus that was generated in the Annual Meeting category, attesting to success of this record-setting event. Revenue in the Endowment category increased some 60% over the previous year. It is this investment revenue that allows GSA to provide periodicals, publications, and services to its membership at less than actual cost.

Important changes were made in 1984 in the way the Society manages its money. The sub-fund structure of the Penrose Fund was simplified through the elimination of the Reserve Fund, and banking arrangements were expanded in Boulder to provide interest-bearing accounts for short-term cash deposits. In the spring the Committee on Investments terminated one money manager and employed two new ones. Currently, a bank manages the GSA debt investments, while stocks are handled by three equity managers (not banks). A performance reward plan has been developed in order to introduce a degree of competition among the equity managers, and the first adjustment under this plan was made in March 1985.

The positive effects of these investment changes can now be seen in improved income from the portfolio (up 16.9%), increased realized net capital gains (up 45.6%), and higher portfolio value at the end of the first quarter of 1985 (up 12% after withdrawals for operations).



# 1985 Annual Meeting Short Courses



## GSA Short Courses

GSA's short courses will be held before and after the GSA Annual Meeting in Orlando, Florida, to be held October 28-31, 1985. The courses will be in several different hotels near the Convention Center. Each hotel has an outdoor swimming pool and good restaurants, so you can both expand your professional knowledge and enjoy the surrounding comforts found in Orlando. The courses are arranged so that you will be able to enjoy a day at one of Orlando's many attractions with family and friends, since the best airfares are for trips that include a Saturday-night stay.

**Enrollment.** Course participation is open to GSA members and nonmembers. Registration for the meeting is not necessary. Registration forms for the short courses and for the annual meeting will be in the August issue of *GSA News & Information*. **PREREGISTRATION DEADLINE IS SEPTEMBER 27.** On-site registration will be \$10 additional.

**Cancellations.** Fees will be refunded if we are notified by October 4. Substitutions may be made at any time. No refunds will be made following the course.

For more information, contact

Course Registrar  
GSA Headquarters  
P.O. Box 9140  
Boulder, CO 80301  
(303) 447-2020

## Geowriting

Two one-day workshops on Saturday, October 26, and Sunday, October 27, 8:00 a.m. to 5:00 p.m. This is a *practical* workshop that will help you break writer's block, organize for fast, efficient writing, and work smoothly with editors. It includes an easy method for dealing with grammar without pain, and also an introduction to writing in the computer age.

**Faculty:** Wendell Cochran, science writer, editor, and photographer. He was editor of *Geotimes* for more than 20 years, and is senior editor of *Geowriting* and co-author of *Into Print*. Cochran holds a master's degree in geology as well as a degree in journalism. He is a charter member of the Society for Scholarly Publishing and of the Association of Earth Science Editors. Since 1979 he has held many workshops on science writing, notably at the annual meetings of GSA and AAPG.

**Limit: 25; Fee: \$75**

## Introduction to Planetary Geology

Saturday, October 26, and Sunday, October 27, 8:00 a.m. to 5:00 p.m.

Co-sponsors: GSA Planetary Geology Division and NASA, Office of Planetary Geology

The objective is to provide an introduction to the methods used in the geological study of the planets and to discuss past, current, and planned activities in NASA's program of solar system exploration. The method of instruction involves lectures by active planetary geology investigators, demonstrations to illustrate important planetary processes, and "hands-on" activities. The fee includes planetary maps, photographs, lecture notes, and NASA books. It also includes a reception the evening of Friday, October 25, and a

dinner the evening of Saturday, October 26. The dinner speaker will be Arden Albee, California Institute of Technology, addressing "Future Missions and Long-Term Goals of NASA for Solar System Exploration."

**Organizer:** Ronald Greeley, principal investigator, NASA Planetary Geology Program

**Principal faculty:** Kathryn Sullivan, geologist-astronaut, Johnson Space Center; James Head and Paul Schultz, Brown University; and Ray Arvidson, Washington University. Four other leading planetary geoscientists will also participate.

**Limit: 60; Fee: \$100**

## An Outline of Balanced Cross Sections

Friday, November 1, and Saturday, November 2, 8:00 a.m. to 5:00 p.m. Cosponsor: GSA Structural Geology and Tectonics Division

The objective is to present how and why balanced, or retrodeformable, cross sections work and are useful and to teach the techniques of constructing balanced sections. Topics to be covered include a review of thrust belt geometries, the fundamentals of the methods of section construction, practical assumptions of retrodeformable sections, the use of relationships between fold and fault shapes (dip-spectral analysis; fault-bend folding; fault-propagation folding), restoring other people's sections, drawing a retrodeformable section, and applications to seismic interpretation. The two-day course will be divided into seven lecture blocks (four on the first day and three on the second) and seven sets of exercises, which alternate. The first day covers the fundamentals, and the second covers applications. Participants are encouraged to bring their own geologic or seismic sections to contribute to the discussion on the second morning. Participants are expected to be at the graduate level and to have a nodding acquaintance with thrust and fold belts.

**Faculty:** Steven E. Boyer, senior petroleum geologist at Sohio Petroleum Company, has twelve years of experience working in the Appalachian Blue Ridge province and throughout the Rocky Mountain region; his paper with David Elliott on thrust systems (*AAPG Bulletin*) is a landmark in thrust belt studies. John Suppe, professor of geology at Princeton University, has twenty years experience in thrust-faulted terrains in the western U.S. and the Far East; he is the author of a new, advanced-level, structural geology text, and his "Geometry and Kinematics of Fault-Bend Folding" (*American Journal of Science*) places the geometric organization of thrust and fold belts onto a new clear footing. Nicholas B. Woodward, assistant professor at the University of Tennessee, has eleven years experience in mapping and structure studies in the Rocky Mountains, the southern Appalachians, northern New England, and Alaska; he has edited a compilation of thirty-four balanced sections of the central and southern Appalachians (*University of Tennessee Studies in Geology*). The fee includes course notes, lunch both days, and a reception the evening of Thursday, October 31.

**Limit: 60; Fee: \$160**

(continued on p. 122)



## Short Courses (continued from p. 121)

### Remote Sensing for Earth Scientists

Sunday, October 27, 8:00 a.m. to 5:00 p.m.

The course provides equal time for lectures and "hands-on" interpretation of representative images by participants. Lectures and interpretation projects cover the major aspects of remote sensing—Landsat, thermal infrared, and radar images, plus digital processing of image data. Course fee includes copies of the "Remote Sensing Laboratory Manual" and "Instructors Key."

Faculty: F. F. Sabins, Senior Research Associate, Chevron Oil Field Research Company. Sabins holds a B.S. degree from the University of Texas, Austin, and his Ph.D. from Yale University. He has been with Chevron since 1955. He also teaches in the Earth and Space Sciences Department at UCLA, received the Allan Gordon Award from the American Society of Photogrammetry, and most recently was recognized with the 1983 Pecora Award, given by the Department of the Interior and NASA for contributions to the science of remote sensing. Sabins wrote the widely used text *Remote Sensing—Principles and Interpretation*.  
Limit: 100; Fee: \$100

### Making Use of UNIX in Geological Applications

Sunday, October 27, 8:00 a.m. to 5:00 p.m.

The objective of the course is to introduce geologists to this state-of-the-art operating system, which has become the de facto standard for the geoscientist. UNIX is a remarkable programming and engineering computing environment. UNIX, now available on many types of hardware, has emerged as the only truly portable multiuser operating system on the horizon within the constructs of software engineering.

The course will demonstrate the variety of effective software tools provided by the system. UNIX is an extremely portable (machine independent) system allowing applications to move between different computing environments along with system-independent implementation of data, programming constructs, I/O, and data manipulation. The system employs the powerful C language and is extremely user friendly.

The course gives an overview of the applications for UNIX, as well as hands-on exercises. This includes discussion of the UNIX environment, C language, and program development. The fee includes computer access, course notes, and lunch.

Faculty: Fritz W. Ehlers, senior analyst, UNIX system, Sperry Corporation, has had 13 years of experience in computers and the geosciences. He has also been employed by Boeing Corp. and Moore McCormick Co. Resources. He is a member of AAAS, GSA, IEEE, and ACM.

Limit: 60; Fee: \$100

### Other Courses and Workshops

The following courses are sponsored by other groups. Further details, including cost and course description, will be in August *GSA News & Information*.

#### Short Courses

**Mollusks.** Sponsored by the Paleontological Society. Sunday, October 27, 8:00 a.m. to 5:00 p.m. For information: David J. Bottjer, Dept. of Geological Sciences, University of Southern California, Los Angeles, CA 90089-0741; (213) 743-8913.

**Modern and Ancient Deep-Sea Fan Sedimentation.** Sponsored by the Society of Economic Paleontologists and Mineralogists. Saturday, October 26, and Sunday, October 27. For infor-

mation: Joni C. Merkel, SEPM, P.O. Box 4756, Tulsa, OK 74159; (918) 743-2498.

**Crystallography.** Sponsored by the Mineralogical Society of America. Thursday through Sunday, October 24-27. For information: G. V. Gibbs, Dept. of Geological Sciences, 5057 Derring Hall, VPI & State University, Blacksburg, VA 24061; (703) 961-6521.

**The Epithermal Environment.** Sponsored by the Society of Economic Geologists. Thursday, October 24, through noon on Sunday, October 27. For information: Lois Elms, Western Experience, 2450 Central Ave., Suite P-2, Boulder, CO 80302; (303) 449-3352.

#### Workshops

**Antarctic Glacial Marine Sedimentation.** Sponsored by the Quaternary Geology and Geomorphology Division. Sunday, October 27, 8:00 a.m. to 5:00 p.m. For information: John B. Anderson, Dept. of Geology, Rice University, P.O. Box 1892, Houston, TX 77251; (713) 527-4884.

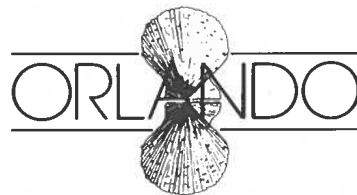
**The Earth as a Planet.** Cosponsored by the GSA Planetary Geology Division and the Lunar and Planetary Institute. Sunday, October 27, 7:30 a.m. to 6:00 p.m. For information: Pam Jones, Lunar and Planetary Institute, 3303 NASA Rd. 1, Houston, TX 77058-4399; (713) 486-2150.

**GEOREF Round-Table for Advanced Users.** Sponsored by AGI and GIS. Monday, October 28, 8:30 a.m. to 12:00 noon. For information: Miriam Sheaves, Geology Librarian, University of North Carolina, Mitchell Hall (029-A), Chapel Hill, NC 27514; (919) 933-2386; or Julie Jackson, AGI, 4220 King Street, Alexandria, VA 22302; (703) 379-2480 or 800+336-4764 (outside Virginia).

**GEOREF Round-Table for Beginners.** Sponsored by AGI and GIS. Thursday, October 31, 8:30 a.m. to 12:00 noon. For information: Same as above.

## Airfare Savings

by Sue Beggs  
GSA Meetings Manager



In these days of fluctuating airfares and airlines, the traveler has to be aware of the tactics needed to secure the most economical airfares, while still receiving service and convenient travel. Here are a few suggestions that can help, for the 1985 GSA Annual Meeting in Orlando and for all other travel.

#### Book Early

Many of the best fares are available only with *advance purchase*. The most common pattern is that the most economical fares are available between 45 and 30 days prior to the flight. The next lowest fares will be 14 days prior to the flight. For the Orlando meeting, this may mean ticketing by September 10, 1985.

#### Be Flexible

The *days of the week* you travel will be critical in determining your fare. If you have a Saturday night stay over, or in some

(continued)



### Airfare Savings (continued)

cases, travel only Monday through Thursday, your fare will be substantially reduced.

Let the agent know of your preferences for convenient routing. If you are content with several stops, plane changes, or a 10-hour itinerary, you may be able to come up with a remarkable fare. Most agents, however, will assume a maximum of one brief stop or plane change.

### Ask About Specials

Ask your agent or airline about *one-way, unrestricted promotional fares and special city-pair promotions*. For example, it may be less expensive to fly Denver-Tampa than Denver-Orlando. Because car rental in Florida is relatively inexpensive, there may be substantial savings.

### Check the New Airlines

Many major carriers are *matching the fares* offered by new "park n' ride" airlines. This does not seem to be the case, however, for Peoples' Express.

### Get the Details on Cancellation and Changes

Most of the advance-purchase restricted fares also have heavy *cancellation and change penalties*. In some cases the penalty may be 25% of the total ticket price. Find out the last date that you can make a change without a penalty.

### Compare

GSA's official travel agency, Cain Travel, is ready to provide services for all GSA travelers. You are encouraged to *compare rates with other agencies and airlines*. Remember to compare the same routing and the same days of travel.

## GSA/Orlando Airline Reservation System

GSA has designated the Cain Travel Group of Boulder, Colorado, as the official airline reservation agent for the 1985 Annual Meeting in Orlando, Florida.

Cain Travel is a resource for those who want to work with a travel agent in determining the best possible airfares. In addition, Cain Travel has negotiated reduced rates with several major carriers that will be available to GSA/Orlando participants only through Cain Travel.

All GSA/Orlando participants booking through Cain Travel will automatically become eligible for inclusion in a drawing for a **free international vacation package** for two. Details will be announced in the August issue of *GSA News & Information*, which will contain the final announcement and registration for the Annual Meeting. The first *two hundred* participants booking through the Cain Travel Group will receive double eligibility for the drawing—in other words, your name will be placed in the drawing pool twice.

### Reservation Procedures

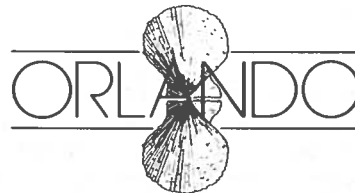
1. Call Cain Travel at (800) 346-4747 (toll free) or (303) 443-2246. Call Monday through Friday, 8:30 a.m. to 5:30 p.m. MST. After August 1, calls will be accepted beginning at 7:00 a.m. MST.
2. Identify yourself as a GSA registrant.
3. The Cain Travel agent will quote you the discounted fare for your itinerary and confirm your reservation.
4. Payment options: check payable to Cain Travel Group; major credit card; invoice to your firm.
5. Tickets will be sent to you via Certified Mail upon receipt of payment or credit card authorization.
6. We advise that you use your home address for mailing, if this is the most reliable way to assure ticket delivery.
7. In the event of a decrease in your airfare, Cain Travel will re-ticket you at the lower fare.

## Effective Slides

Good slides amplify and clarify the message, stimulate interest, and help the speaker keep "on the track." They merit the same care in preparation as the commentary. Ideally, the speaker should work with a specialist who can translate information into effective visuals, and who will instruct an artist and a photographer in making slides. Whether or not such assistance is available to you, here are some of the ways to make effective lecture slides. While the emphasis here is on 2x2 in. (50x50 mm) slides, the general information applies also to other projected visuals.

This is the third of a three-part series on speaker effectiveness. The other two articles were in the May and June issues of *GSA News & Information*.

**Reminder:** Two screens and two projectors will be available in each session room at the GSA Annual Meeting in Orlando. You may use just one screen and one projector, however. Suggestions for preparing a two-screen presentation (May *GSA News & Information*) will be sent to speakers scheduled for the Orlando meeting.



### AVOID ERRORS

Most errors in slide-making stem from the mistaken assumption that legibility in one form assures legibility in another. A person ordinarily reads printed material at a distance of 12 to 14 in. (305 to 356 mm). But frequently at a slide presentation the image projected is only 4x6 ft (1.2x1.8 m); the rear seats are 70 ft (21.3 m) from the screen! Reading the text of a 4-ft high (1.2 m) image at 70 ft (21.3 m) is like reading a 1¼x1¼ in. miniature version of this page. Only the titles would be legible. The rest of the text would be a visual jumble of tiny black spots. Plan line weights of charts and graphs carefully for greatest legibility. Make curves prominent. Construct axis and grid lines so they are clearly visible but relatively inconspicuous.

### IMPORTANT POINTS

#### Format

- Limit each slide to one main idea.
- Use a slide series for progressive disclosure—it clarifies greatly.

(continued on p. 124)

## Effective Slides (continued from p. 123)

- If field photos are used, don't try to illustrate the entire stratigraphic sequence with one photo; be sure the picture was properly exposed and has adequate color density for large size projection.
- Use several simple slides rather than one complicated one, especially if you must discuss a subject at length.
- Use duplicates if you need to refer to the same slide at several different times in your talk. It is impractical for the projectionist to search for and reshow a slide.
- Include titles to supplement, not duplicate, slide data.

### Color

- Use 2x2 in. (50x50 mm) color slides—they are effective, easy to make, and inexpensive. Color film is also convenient for making slides from black-and-white copy.
- Stark black on white (or white on black in some cases) can be eye-tiring. White lettering on blue background achieves excellent legibility. Also, consider a light blue, green, or yellow (not red) background.

### Letter Size

- Be certain that lines and lettering can be read from any point in the room. An easy test is that if you can read all the information on the slide with unaided eye, it will project properly. This test can be applied only after the slide is prepared. In copy preparation, you can assume that you will achieve this if you confine yourself to a 7x10 in. sheet of paper, leave a 1-in. blank on all sides, use no lettering less than 5 mm high and no line width less than 1 mm, avoid serif or italic type, and keep your lettering on the horizontal.
- Leave space—at least the height of a capital letter—between lines.
- Limit each slide to 15 to 20 words, or 25 to 30 elements; no more than you will discuss. Crowded tabular data should be avoided.

### Presentation

- Plan your slides for a good visual pace in your presentation. Don't leave a slide on the screen after discussing its subject.
- Thumb-spot all slides in the lower left corner when the slide reads correctly on hand viewing. Add sequence numbers.
- Rehearse your slide presentation several times so that you will be familiar with the sequence and timing of the slides.
- On your trip, carry your slides with you—in the tray, if possible. Don't trust them to your baggage if it is checked through.
- Use the Speaker Ready Room to review the order of slides.

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## GSA Employment Service

### Can You Interview in November?

Are you looking for a new position in the field of geology? Would you like to interview with potential employers in October? Take advantage of GSA's Employment Interview Service, which is provided each fall in conjunction with the Society's Annual Meeting. The service brings potential employers and employees together for face-to-face interviews. Mark your calendar for October 28-31, 1985, in Orlando, Florida.

If you plan to interview at the GSA Annual Meeting, GSA must receive your material no later than August 12, 1985. Complete the application on the following page and send it with a one- or two-page resume and your check, money order, or charge information to the address on the form. A one-year listing for GSA members and students costs \$25; the cost for nonmembers is \$50. If we receive your materials by August 12, your record will be included in the information that employers receive prior to the meeting. Submit your forms early to receive maximum exposure! Don't forget to indicate on your application form that you would like to interview in October.

Plan now for the annual Interview Service in Orlando. See you there!

### Searching for a New Geoscientist?

When was the last time you hired a new employee? Do you remember how much time and effort you wasted in your search for a qualified geoscientist? Let the GSA computerized search file make your job easier.

How does it work? Complete the Employer's Request for Earth Science Applicants on the following page. Remember to specify educational and professional experience requirements as well as the specialty area or areas of expertise your applicant should have. The GSA computer will take it from there.

You will receive a printout that includes the applicants' names, addresses, phone numbers, areas of specialty, type of employment desired, degrees held, years of professional experience, and current employment status. In 1985, the cost of a printout for one or two specialty codes is \$125. (For example, in a recent job search for an analyst of inorganic materials, the employer requested the specialty codes of geochemistry and petrology.) Each additional specialty is \$45. A printout of the entire applicant listing in all specialties is available for \$350. If you have any questions about your personalized computerized search, GSA's Membership Department will assist you.

The GSA Employment Service is available year long. Now is an excellent time to use the service—in conjunction with the annual Employment Interview Service. The interview service is offered each fall at the Society's Annual Meeting. The 1985 Annual Meeting will be held in Orlando, Florida, October 28-31. You may rent interview space in half-day increments from GSA. Our staff will schedule all interviews with applicants for you, the recruiter. In addition, GSA offers a message service, complete listing of applicants, copies of resumes at no additional charge, and a posting of all vacancies.

You can attend the Annual Meeting and still have that new position filled before you return to work! See you in Orlando.

**APPLICANT AND EMPLOYER FORMS  
ARE BACK TO BACK  
ON THE FOLLOWING PAGES**



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Ck # \_\_\_\_\_  
Ltr. \_\_\_\_\_  
GSA \_\_\_\_\_  
Add. \_\_\_\_\_

**APPLICATION FOR EMPLOYMENT MATCHING SERVICE** (Please type or print legibly with **black ink**)

(Mr. )  
**NAME** (Ms. ) \_\_\_\_\_ **Date** \_\_\_\_\_  
(last name first)

**Mailing Address** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip Code** \_\_\_\_\_

**Telephone ( )** \_\_\_\_\_ **Date Available** \_\_\_\_\_ **Visa** \_\_\_\_\_  
**area code Business Home** If not U.S. citizen, list visa

**Members of GSA ONLY:** Check here if you **DO NOT WISH** to have this number included in the Membership Directory

**EXPERIENCE**

Must use specialty codes listed below. Choose three that best describe your expertise in order of importance.

\* 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

**TYPE OF POSITION DESIRED**

- |                                     |   |  |
|-------------------------------------|---|--|
| <b>Interested in</b>                | <b>Specific interest</b>                        | <b>Will accept employment in</b>                       |
| <input type="checkbox"/> Academic   | <input type="checkbox"/> Administration         | <input type="checkbox"/> U.S. only                     |
| <input type="checkbox"/> Government | <input type="checkbox"/> Exploration/Production | <input type="checkbox"/> U.S. with foreign assignments |
| <input type="checkbox"/> Industry   | <input type="checkbox"/> Field                  | <input type="checkbox"/> Either                        |
| <input type="checkbox"/> Other      | <input type="checkbox"/> Research               |  |
|                                     | <input type="checkbox"/> Teaching               |  |

\* **PRESENT SPECIALTY**

Choose one from codes listed below \_\_\_\_\_ **YEARS EXPERIENCE IN THIS SPECIALTY** \_\_\_\_\_

**PRESENT EMPLOYER** \_\_\_\_\_ May he/she be contacted? Yes  No

If you do not wish to be listed for employment with a specific organization, check here  and list organization on an attached sheet.

**Give number of years experience for any of the following that are applicable:**

Administrative \_\_\_\_\_ Exploration/Production \_\_\_\_\_ Field \_\_\_\_\_ Research \_\_\_\_\_ Teaching \_\_\_\_\_ Total geological working experience \_\_\_\_\_

**KNOWLEDGE OF FOREIGN LANGUAGES:** French \_\_\_\_\_ ; German \_\_\_\_\_ ; Russian \_\_\_\_\_ ; Spanish \_\_\_\_\_ ; Other \_\_\_\_\_

**ACADEMIC TRAINING**

College or University	Degree (rec'd or expected)	Year	Major	Minor

**Postgraduate work beyond highest degree in (field)** \_\_\_\_\_ **Number of years** \_\_\_\_\_

**SPECIALTY CODES**

Select those that best describe your ability. Use codes in bold face only when other breakdowns are inadequate.

- |  |                                  |                              |                               |                                |
|--|----------------------------------|------------------------------|-------------------------------|--------------------------------|
| 100. <b>Economic Geology</b>                     | 224. stable isotopes             | 351. computer science        | <b>500. Petroleum Geology</b> | <b>630. Science Editing</b>    |
| 101. coal geology                                | 225. geochronology               | 352. statistical geology     | 501. exploration              | <b>650. Sedimentology</b>      |
| 102. geothermal, etc.                            | <b>250. Geomorphology</b>        | <b>400. Mineralogy</b>       | 502. subsurface               | 651. sedimentary processes     |
| 103. metallic deposits                           | 251. Pleistocene geology         | 401. crystallography         | stratigraphy                  | 652. sedimentary environments  |
| 104. nonmetallic deposits                        | <b>300. Geophysics</b>           | 402. clay mineralogy         | <b>520. Petrology</b>         | <b>720. Stratigraphy</b>       |
| 105. mining geology                              | 301. seismic                     | <b>410. Museum (curator)</b> | 521. igneous                  | <b>750. Structural Geology</b> |
| <b>120. Engineering Geology</b>                  | 302. gravity/magnetics           | <b>420. Oceanography</b>     | 522. metamorphic              | 751. tectonics                 |
| <b>150. Environmental Geology</b>                | 303. seismicity                  | 421. marine geology          | 523. sedimentary (clastic)    | 752. tectonophysics            |
| <b>160. Public Education &amp; Communication</b> | 304. paleomagnetism              | 422. coastal geology         | 524. sedimentary (carbonate)  | 753. rock mechanics            |
| <b>200. General Geology</b>                      | <b>320. Hydrogeology</b>         | <b>450. Paleontology</b>     | 525. experimental             | <b>800. Volcanology</b>        |
| <b>220. Geochemistry</b>                         | 321. hydrochemistry              | 451. invertebrate            | <b>550. Planetology</b>       |                                |
| 221. organic                                     | 322. ground water                | 452. vertebrate              | <b>600. Regional Geology</b>  |                                |
| 222. high temperature                            | 323. surface water               | 453. micropaleontology       | <b>620. Remote Sensing</b>    |                                |
| 223. low temperature                             | <b>330. Library</b>              | 454. paleobotany             | 621. photogeology             |                                |
|  | <b>350. Mathematical Geology</b> | 455. paleoecology            | 622. photogrammetry           |                                |

\* **Résumé must be attached, limited to two pages, typewritten on one side only, to be acceptable for reproduction to employers. Include your name, address, and phone number; concise details of work experience; and majors/minors on degrees.**

\* **Fee: \$25 if you are a Member or Student Associate of GSA in good standing (Member # \_\_\_\_\_) \$50 if you are not a member of GSA. Payment in U.S. funds (check, money order, or charge information MUST ACCOMPANY FORM). MAKE CHECK PAYABLE TO THE GEOLOGICAL SOCIETY OF AMERICA.**

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Card Expires Mo Yr \_\_\_\_\_ Card Number \_\_\_\_\_

Signature \_\_\_\_\_ (Required for credit card payment)

I agree to release GSA or their representatives from responsibility for errors that may occur in processing or distributing this data. I understand that GSA makes **no guarantees** of contact by an employer in this service. I agree to notify GSA Employment Service immediately of (1) change of address, (2) acceptance of a position.

I will attend the 19 \_\_\_\_\_ GSA Annual Meeting in \_\_\_\_\_

\* **SIGNATURE (required)**

\* **THESE ITEMS ARE ABSOLUTELY NECESSARY TO PROCESS THIS APPLICATION**

This application will be active for 1 year

1/85



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**EMPLOYER'S REQUEST FOR EARTH SCIENCE APPLICANTS**

(Please type or print legibly)

Name \_\_\_\_\_ Date \_\_\_\_\_

Organization \_\_\_\_\_

Mailing address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip code \_\_\_\_\_ Telephone number \_\_\_\_\_  
(Area code) Number

**SPECIALTY CODES (see list below)**

List the specialty code numbers that you wish to order, or  check here if you want entire file of applicants in ALL specialties.

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_

**SPECIALTY CODES**

<b>100. Economic Geology</b>	224. stable isotopes	351. computer science	<b>500. Petroleum Geology</b>	<b>630. Science Editing</b>
101. coal geology	225. geochronology	352. statistical geology	501. exploration	<b>650. Sedimentology</b>
102. geothermal, etc.	<b>250. Geomorphology</b>	<b>400. Mineralogy</b>	502. subsurface stratigraphy	651. sedimentary processes
103. metallic deposits	251. Pleistocene geology	401. crystallography	<b>520. Petrology</b>	652. sedimentary environments
104. nonmetallic deposits	<b>300. Geophysics</b>	402. clay mineralogy	521. igneous	<b>720. Stratigraphy</b>
105. mining geology	301. seismic	<b>410. Museum (curator)</b>	522. metamorphic	<b>750. Structural Geology</b>
<b>120. Engineering Geology</b>	302. gravity/magnetics	<b>420. Oceanography</b>	523. sedimentary (clastic)	751. tectonics
<b>150. Environmental Geology</b>	303. seismicity	421. marine geology	524. sedimentary (carbonate)	752. tectonophysics
<b>160. Public Education &amp; Communication</b>	304. paleomagnetism	422. coastal geology	525. experimental	753. rock mechanics
<b>200. General Geology</b>	<b>320. Hydrogeology</b>	<b>450. Paleontology</b>	<b>550. Planetology</b>	<b>800. Volcanology</b>
<b>220. Geochemistry</b>	321. hydrochemistry	451. invertebrate	<b>600. Regional Geology</b>	
221. organic	322. ground water	452. vertebrate	<b>620. Remote Sensing</b>	
222. high temperature	323. surface water	453. micropaleontology	621. photogeology	
223. low temperature	<b>330. Library</b>	454. paleobotany	622. photogrammetry	
	<b>350. Mathematical Geology</b>	455. paleoecology		

Applicants seeking employment in:	Minimum degree required	Minimum professional experience		Experience desired (yrs.)		
				None	1-5	6-plus
<input type="checkbox"/> Academic	<input type="checkbox"/> None	<input type="checkbox"/> None	Administrative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Government	<input type="checkbox"/> B.A. or B.S.	<input type="checkbox"/> 1-5 yrs.	Exploration/Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Industry	<input type="checkbox"/> M.A. or M.S.	<input type="checkbox"/> 6-plus	Field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other _____	<input type="checkbox"/> Ph.D		Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			Teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Employment in:**  U.S. only  U.S. with foreign assignments  Either

**Foreign Languages:**  French  German  Russian  Other \_\_\_\_\_  Not required

I am interested in interviewing applicants through the GSA Employment Service at the 19 \_\_\_\_\_ Annual Meeting in \_\_\_\_\_.

See attached sheet for current fee schedule.

1. I agree to use this service for valid recruiting purposes.  
2. I agree that no placement charges will be assessed to any applicant participating in the GSA Employment Matching Service.

**Total fee enclosed** ..... \$ \_\_\_\_\_

**or invoice requested** ..... \$ \_\_\_\_\_

Signature (required) \_\_\_\_\_

# MEETINGS

1985

**International Symposium on Karst Water Resources**, July 7-19, 1985, Ankara and Antalya, Turkey. Information: A. Ivan Johnson, Woodward-Clyde Consultants, 7600 East Orchard Rd., Harlequin Plaza North, Englewood, CO 80111.

**Conference on Stable Isotopes and Fluid Processes in Mineralization**, July 10-12, 1985, Brisbane, Australia. Information: John M.W. Rynn, Dept. of Geology and Mineralogy, University of Queensland, St. Lucia, Queensland 4067, Australia.

**International Estuarine Conference**, July 28-August 2, 1985, Durham, New Hampshire. Information: Bjorn Kjerfve, Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina, Columbia, SC 29208; (803) 777-4529.

**International Clay Conference**, July 28-August 2, 1985, Denver, Colorado. Information: Western Experience, Ltd., 2450 Central Ave., P2, Boulder, CO 80302; (303) 449-3352.

**Society of Economic Paleontologists and Mineralogists 2nd Annual Midyear Meeting, Golden Prospects for Science and Industry**, August 11-14, 1985, Golden, Colorado. Information: Steve Sonnenberg, 1000 Writer Square, 1512 Larimer St., Denver, CO 80202; (303) 571-1314.

**Zeolite '85**, August 12-16, 1985, Budapest, Hungary. Information: J. Engelhardt, Central Research Institute for Chemistry, Hungarian Academy of Sciences, H-1525 Budapest, P.O. Box 17, Hungary.

**Sixth Gondwana Symposium**, August 19-23, 1985, Columbus, Ohio. Information: Sixth Gondwana Symposium, Institute of Polar Studies, Ohio State University, Columbus, OH 43210; (614) 422-6531.

**IVth Chilean Geological Congress**, August 19-24, 1985, Antofagasta, Chile. Information: Organizing Committee, IVth Chilean Geological Congress, Dept. of Geosciences, Universidad del Norte, Casilla 1280, Antofagasta, Chile; phone 222040-205.

**International Symposium on Geothermal Energy**, August 26-30, 1985, Kailua-Kona, Hawaii. Information: Geothermal Resources Council, P.O. Box 1350, Davis, CA 95617-1350; (916) 758-2360.

**Symposium on Modern and Ancient Clastic Tidal Deposits**, August 26-28, 1985, Utrecht, Netherlands. Information: S. D. Nio, Comparative Sedimentology Division, University of Utrecht, Budapestlaan 4, 3584 CD Utrecht, Netherlands; telephone 030/53.51.21.

**Tectonostratigraphic Terranes of Circum-Pacific Orogenic Belts and Their Relationships to Energy and Mineral Resources**, August 26-29, 1985, Sydney, Australia. Information: Secretary, 3rd Circum-Pacific Terrane Conference, Earth Resources Foundation, Edgeworth David Building, University of Sydney, New South Wales 2006, Australia.

(continued on p. 128)

## GSA REVIEWS IN ENGINEERING GEOLOGY VI MAN-INDUCED LAND SUBSIDENCE

Edited by Thomas L. Holzer

Every earth scientist should be keenly interested in the timely and important subject of this GSA volume. Land subsidence has been caused by man in at least 37 states of the U.S.A. It affects an aggregate area of more than

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EDITED BY THOMAS L. HOLZER

40,000 km<sup>2</sup> and may cost the nation as much as \$100 million annually.

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**Meetings** (continued from p. 127)

**Calgary Geotech '85**, on use of microcomputers in oil and gas exploration, September 5-6, 1985, Calgary, Alberta. Information: Michael Marchand, Canterra Energy Ltd., P.O. Box 1051, Calgary, Alberta, Canada T2P 2K7; (403) 267-9380.

**Problems of the Stratigraphy and Paleogeography of Loesses**, September 6-10, 1985, Lublin, Poland. Information: Henryk Maruszczak, Department of Physical Geography, University Marie Curie-Sklodowska, Akademicka 19, 20-33 Lublin, Poland.

**Hydrological Applications of Supercomputers—Future Directions**, September 10-12, 1985, West Lafayette, Indiana. Information: F. J. Wobber, ER/75, USDOE, Office of Energy Research, Washington, DC 20545; (301) 353-5549.

**6th International Conference on Basement Tectonics**, September 16-20, 1985, Santa Fe, New Mexico. Information: M. J. Aldrich, Jr., Mail Stop D462, Los Alamos National Laboratory, Los Alamos, NM 87545; (505) 667-1495 or 7590.

**American Institute of Professional Geologists Annual Meeting**, September 17-21, 1985, St. Paul, Minnesota. Information: Robert E. Pendergast, Geotechnical Engineering Corp., 1925 Oakcrest Ave., Roseville, MN 55113; (612) 636-7744.

**Second International Mine Water Congress**, September 17-21, 1985, Granada, Spain. Information: R. Fernandez Rubio, School of Mines, Technical University of Madrid, Rios Rosas, 21, Madrid 3, Spain.

**Houston Geotech 85: Microcomputer Applications in Petroleum Geology**, September 22-24, 1985, Houston, Texas. Information: Bruce Lemmon, AAPG Convention Dept., P.O. Box 979, Tulsa, OK 74101; (918) 584-2555.

**High Heat Production Granites, Hydrothermal Circulation and Ore Genesis**, September 22-25, 1985, Cornwall, England. Information: Conference Office, Institution of Mining and Metallurgy, 44 Portland Pl., London W1N 4BR, England; 01-580 3802, Telex 261410 IMM.

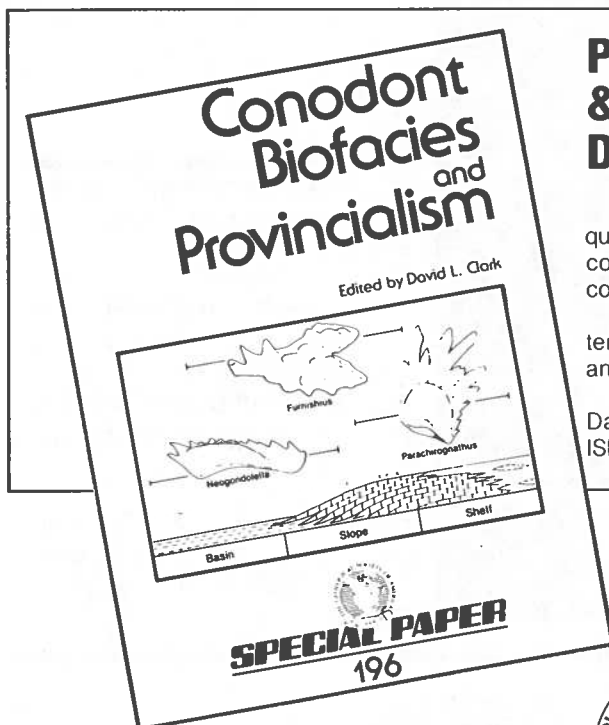
**Institute for Tertiary-Quaternary Studies (TER-QUA '85)**, Annual Meeting, September 30-October 2, 1985, Lawrence, Kansas. Information: Wakefield Dort, Jr., Dept. of Geology, University of Kansas, Lawrence, KS 66045.

**Computer Applications in Oil and Gas Exploration and Development**, October 3-5, 1985, Wichita, Kansas. Information: D. F. Merriam, Dept. of Geology, Wichita State University, Wichita, KS 67208; (316) 689-3140.

**Association of Engineering Geologists Annual Meeting**, October 7-11, 1985, Winston-Salem, North Carolina. Information: Norman R. Tilford, Ebasco Services, 2211 Meadowview, Greensboro, NC 27047; (919) 855-7500.

**International Symposium on Management of Hazardous Chemical Waste Sites**, October 9-10, 1985, Winston-Salem, North Carolina. Information: Norman R. Tilford, Dept. of Geology, Texas A&M University, College Station, TX 77843-3115; (409) 845-9682.

(continued)



## Provincialism Documented & Contrasted with Biofacies Developments.

Those working with conodonts have been challenged to develop quantitative methods for biofacies definition with the expectation that conodont biofacies could be as useful as the well established utility of conodonts in biostratigraphy.

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**Recent Advances in Interpretations of Late Paleozoic Cyclothem, Midcontinent SEPM Field Conference**, October 11-13, 1985, Lawrence, Kansas. Information: W. L. Watney, Kansas Geological Survey, 1930 Constant Ave.—Campus West, Lawrence, KS 66044; (913) 864-4991.

**16th Annual Underwater Mining Institute**, October 20-23, 1985, Halifax, Nova Scotia. Information: Helen Joseph, Ocean Mining Division, 355 River Rd., Ottawa, Ontario K1A 0E4, Canada; (613) 993-3760; or Allen H. Miller, UW Sea Grant Institute, 1800 University Ave., Madison, WI 53705; (608) 262-0645.

**Geological Society of America Annual Meeting**, October 28-31, 1985, Orlando, Florida. Information: Meetings Department, GSA, P.O. Box 9140, Boulder, CO 80301; (303) 447-2020.

**Eastern Oil Shale Symposium**, November 18-20, 1985, Lexington, Kentucky. Information: Connie S. Blakemore, Institute for Mining and minerals Research, University of Kentucky, P.O. Box 13015, Lexington, KY 40512-3015. (Abstracts deadline is July 15, 1985.)

## 1986

**6th Offshore South East Asia Conference**, January 28-31, 1986, Singapore. Information: D. H. Morgan, SEAPEX OSEA Committee, Marathon Petroleum Exploration, Ltd., P.O. Box 227, Tanglin Post Office, Singapore 9124.

**International Volcanological Congress**, February 1-9, 1986, New Zealand. Information: John A. Gamble, Victoria University, Private Bag, Wellington, New Zealand.

**Geotechnical and Geohydrological Aspects of Waste Management Symposium**, February 5-7, 1986, Fort Collins, Colorado. Information: Eighth Annual Symposium on Geotechnical and Geohydrological Aspects of Waste Management, Geotechnical Engineering Program, Civil Engineering Dept., Colorado State University, Fort Collins, CO 80523; (303) 491-6081. (Abstracts deadline is July 17, 1985.)

**Fourth Federal Sedimentation Conference**, March 24-27, 1986, Las Vegas, Nevada. Information: Doug Glysson, U.S. Geological Survey, 412 National Center, Reston, VA 22092; (703) 860-6834.

**Geochemistry and Mineralisation of Proterozoic Volcanic Suites**, April 2-5, 1986, Nottingham, England. Information: Tim Pharaoh, Deep Geology Research Group, British Geological Survey, Keyworth, Nottingham NG12 5GG, England.

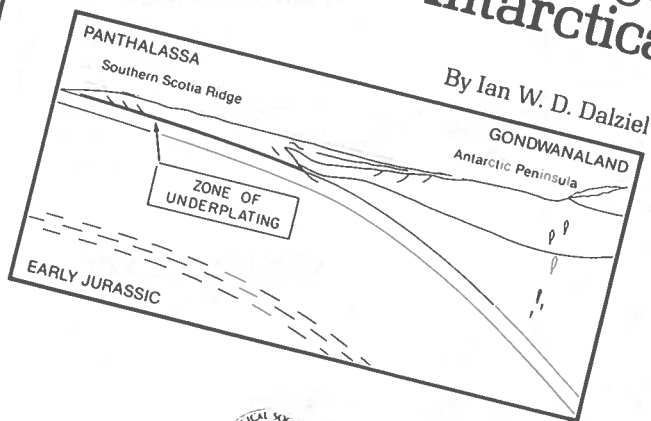
**International Symposium on Coal and Coal-bearing Strata**, April 8-11, 1986, London. Information: A. C. Scott, Geology Dept., Chelsea College, 552 King's Road, London SW10 0UA, England.

**Experimental Mineralogy and Geochemistry: Applications to Petrology and Ore Deposits**, April 17-19, 1986, Nancy, France. Information: A. Weisbrod, E.N.S.G., B.P. 452, 54001 Nancy Cedex, France.

**International Symposium on Environmental Geotechnology**, April 21-24, 1986, Allentown, Pennsylvania. Information: H. Y. Fang, Geotechnical Engineering Div., Dept. of Civil Engineering, Lehigh University #13, Bethlehem, PA 18015; (215) 861-3549 or 3520.

(continued on p. 130)

# Tectonic Evolution of a Forearc Terrane, Southern Scotia Ridge, Antarctica



By Ian W. D. Dalziel

GSA Special Paper 200:  
*Tectonic Evolution of a Forearc Terrane, Southern Scotia Ridge, Antarctica*, by Ian W. D. Dalziel, 8½" × 11", paperback, 37 pages, illustrated. ISBN 0-8137-2200-4, CIP, paperback . . . . . \$ 9.00.

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**200**



**Meetings** (continued from p. 129)

**Geological Association of Canada—Mineralogical Association of Canada Annual Meeting**, May 19–21, 1986, Ottawa, Ontario. Information: J. A. Donaldson, Dept. of Geology, Carlton University, Ottawa, Ontario K1S 5B6, Canada; (613) 231-2630.

**Third International Conference on Geoscience Information**, June 1–5, 1986, Adelaide, Australia. Information: Secretary, Organising Committee 3ICGI, Australian Mineral Foundation, PB97, Glenside, South Australia 5065.

**27th U.S. Symposium on Rock Mechanics**, June 23–25, 1986, University, Alabama. Information: Howard L. Hartman, Dept. of Mineral Engineering, University of Alabama, P.O. Box 1468, University, AL; (205) 348-6578. (Abstracts deadline is September 27, 1985.)

**6th International Conference on Geochronology, Cosmochronology and Isotope Geology**, June 30–July 4, 1986, Cambridge, England. Information: Organising Committee, Sixth International Conference, Dept. of Earth Sciences, University of Cambridge, Downing St., Cambridge CB2 3EQ, England.

**Geocongress '86**, July 7–11, 1986, Johannesburg, South Africa. Information: Symposium Secretariat, S. 339, CSIR, P.O. Box 395, Pretoria, Republic of South Africa 0001.

**Deep Seismic Reflection Profiling of the Continental Lithosphere**, July 15–17, 1986, Cambridge, England. Information: Bullard Laboratories, Madingley Rise, Madingley Rd., Cambridge CB3 0EZ, England.

**Fifth International Symposium on Water-Rock Interaction**, August 8–17, 1986, Reykjavik, Iceland. Information: Halldor Armannsson, Orkustofnun — National Energy Authority, Grensasvegur 9, 108 Reykjavik, Iceland.

**Basins of Eastern Canada and Worldwide Analogues**, August 13–15, 1986, Halifax, Nova Scotia. Information: Secretary, Dept. of Oceanography, Dalhousie University, Halifax, Nova Scotia, Canada B3H 4J1.

**Circum-Pacific Energy and Mineral Resources Conference**, August 17–22, 1986, Singapore. Information: Allen G. Hatley, c/o Gaffney, Cline & Assoc., P.O. Box 76309, Dallas, TX 75379.

**Third U.S. National Conference on Earthquake Engineering**, August 24–28, 1986, Charleston, South Carolina. Information: James E. Beavers, Martin Marietta Energy Systems, Inc., Bldg. 9733-4, M/S 2, P.O. Box Y, Oak Ridge, TN 37831.

**International Symposium on Large Rock Caverns**, August 25–28, 1986, Helsinki, Finland. Information: International Symposium on Large Rock Caverns, Technical Research Center of Finland, Lehtisaarentie 2, SF-00340 Helsinki, Finland; telephone 358-0-4566172; Telex 122972 vttha sf.

**Second International Conference on Paleooceanography**, September 7–12, 1986, Woods Hole, Massachusetts. Information: W.A. Berggren, Dept. of Geology & Geophysics, Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

(continued)

A new GSA Special Paper by A.M.C. Şengör, the product of his long-standing interest in Tethyan problems.

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GSA Special Paper 195: **The Cimmeride Orogenic System and the Tectonics of Eurasia**, by A. M. Celâl Şengör, 8½" × 11", paperback, 91 pages, illustrated, with subject & author indexes and one folded map insert. ISBN 0-8137-2195-4, CIP, paperback . . . \$17.00.

# The CIMMERIDE OROGENIC SYSTEM and the TECTONICS of EURASIA

A. M. Celâl Şengör



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## Meetings (continued)

**1986 International Gas Research Conference**, September 8-11, 1986, Toronto, Ontario. Information: 1986 International Gas Research Conference, c/o Gas Research Institute, 8600 West Bryn Mawr Ave., Chicago, IL 60631; (312) 399-8300, Telex 253812 or 503802. (Abstracts due July 31, 1985.)

**Society of Economic Paleontologists and Mineralogists Third Annual Midyear Meeting**, September 26-28, 1986, Raleigh, North Carolina. Information: Chuck Nittrouer, Dept. of Marine, Earth and Atmospheric Sciences, North Carolina State University, Raleigh, NC 27695. (Abstracts due April 1, 1986.)

## GSA 1986

### Penrose Conferences

**Southern Oklahoma Aulacogen**, March 24-28 or March 17-21, 1986, Lone Wolf, Oklahoma. Information: M. Charles Gilbert, Dept. of Geology, Texas A&M University, College Station, TX 77843; (409) 845-2464 or 845-2451.

**Reefal Development in a Terrigenous Province**, May 17-21, 1986, Veracruz, Mexico. Information: Paul R. Krutak, ARCO Exploration Co., P.O. Box 51408, Lafayette, LA 70505; (318) 264-4452.

**Annual Meeting**—November 10-13, 1986, San Antonio, Texas.

## Special AGU Session Slated

A special half-day session on "Hydrologic Monitoring with Microelectronics" will be held during AGU's 1985 Fall Meeting (Dec. 9-13). The session will explore high-tech data collection systems for surface and subsurface waters as well as precipitation. It will also investigate factors associated with microelectronics in the collection, entry, and analysis of data. Persons interested in presenting a paper should contact Phil Durgin, Redwood Sciences Lab., 1700 Bayview Dr., Arcata, CA 95521; (707) 822-3691.

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