

# THE ENERGY MINERALS GEOLOGIST

Newsletter of the Energy Minerals Division  
of the American Association of Petroleum Geologists

Volume 4  
Number 4  
June, 1993

AUG 10 1993

## EMD PRESIDENT'S MESSAGE



Greetings! I have been very honored to have had the opportunity to serve as EMD President from July '92 through June '93. My election, while I served in the desert of Desert Storm, has made the position uniquely special. I have felt that the Division supported me during my time overseas, and I'll always be grateful.

During this year, I've tried to practice a form of total quality management. To initiate this approach, I asked for feedback from the Council, Executive Committee, and members on the important requirements for the Division to accomplish. I certainly was not disappointed, and received plenty of comments on many matters.

EMD accomplished some important objectives this year. These were as follows:

- 1) **To provide for good internal and external communications.** This was accomplished with our newsletter (thanks to Doug Peters, Sam Friedman, and many correspondents) and our Council newsletter, the EMD Hour Glass. Both provided for information flow to and feedback from EMDers.
- 2) **To develop a procedure to certify EMD Geologists.** Mitch Blake and his DPA counterparts have done a grand job at providing guidelines for coal geologist certification. The plans have been accomplished as a first step toward future certification for other EMD geologists.
- 3) **To establish an Honors and Awards Committee of past presidents.** This committee has identified nominees for awards. Sam Friedman has done a super job in developing a good slate of awardees, recognizing significant EMD contributions. He also wants to promote deserved EMD members for AAPG Distinguished Service and Honorary Membership awards.
- 4) **To have an EMD Fall business meeting at AAPG headquarters.** This gathering allowed the group to discuss pertinent EMD items without the "distraction" of an Annual Meeting. This yielded good discussions and information. AAPG Headquarters served us very well, but we may not need to meet there every year.
- 5) **To have a bigger booth at the Annual Meeting.** The purpose of our double booth was to draw a bigger crowd, promote EMD awareness, and build membership. We added 12 new members and had many people visit us (we also gave away 500 EMD 6-in. rulers).
- 6) **To attend as many Section meetings as possible.** I attended Rocky Mountain, Eastern, and Gulf Coast Section meetings — where we have most of our membership. I enjoyed meeting our EMD colleagues and tried to be supportive of their meeting.
- 7) **To establish cooperation between all Divisions.** This has occurred with panache. The three Division Presidents have worked together with a cooperative spirit. All three have had an interest in the mutual success of each other's enterprise. The fruits of this effort have been the EMD certification effort and joint meetings/luncheons.
- 8) **To establish a president/past officers/councilors breakfast at the Annual Meeting** to "honor" and remember those who have served EMD, and those who serve now — a great success.
- 9) **To raise dues to \$15.00.** Reluctantly, we had to do this for the financial health of our Division.
- 10) **To gain and retain members.** We are very successful at this. We are within one of our highest-ever membership total (2036 as of April).
- 11) **To provide EMD speakers for the Visiting Petroleum Geologists Program.** The VPG Committee chairperson was very enthusiastic about broadening the VPG scope to include speakers on other topics. A few EMD speakers have already offered their services, and VPG voted to change its name to Visiting Geologists Program.
- 12) **To have a great convention.** Mike Fein and his colleagues did wonderfully!

The EMD team has done well this year. We have built on the strides of the past while we have looked toward the future. I think we can all say that EMD is better for us having been here.

— Carl J. Smith

## 1993 EMD ELECTION RESULTS

Vice-President/President-Elect 1993-1995:

**Charles G. "Chip" Groat**

Secretary-Treasurer 1993-1995:

**Frank D. Pruett**

Canadian Section Councilor 1993-1995:

**Dennis J. Nikols**

Gulf Coast Section Councilor 1993-1995:

**H. Robert Hopkins**

Southwest Section Councilor 1993-1995:

**Robert G. Maynard**

### Selected statistics:

Total # of ballots returned = 304 (15% of membership in March)

# ballots returned from Canadian Section = 13 (21% of December 1992 membership)

# ballots returned from Eastern Section = 44 (13%)

# ballots returned from Gulf Coast Section = 67 (15%)

# ballots returned from Mid-Continent Section = 27 (16%)

# ballots returned from Pacific Section = 31 (16%)

# ballots returned from Rocky Mountain Section = 58 (18%)

# ballots returned from Southwest Section = 50 (26%)

# ballots returned from non-section members = 14 (4%)

# ballots unmarked for any position = 1

Congratulations to the new Council members and our sincere thanks to the other candidates who so graciously offered their services to EMD in these capacities. Photographs for elected members of the 1993-1994 EMD Council will be included in the next issue of the newsletter.

## EMD AND DPA TO INITIATE COAL GEOLOGIST CERTIFICATION

At the 1993 Annual Meeting in New Orleans, the EMD Council and DPA Advisory Board unanimously approved beginning a Coal Geologist Certification program modeled after DPA's current Certified Petroleum Geologist (CPG) program. With the interest bases of many AAPG members enlarging due to today's changing employment picture, EMD's Council felt it was time to begin a certification program for its membership. Coal Geolo-

## QUESTION TO MEMBERSHIP ON ELECTIONS

As can be seen from the statistics, the return of ballots for the 1993 election was disappointingly small, only 15%. Therefore, the EMD Council has the following question for the members: Is there a specific reason you did not vote or return the ballot in time for it to be included? The deadline was May 14, which was about 6 weeks after the ballots were mailed from Tulsa. All ballots postmarked by that date were accepted.

Part of the question relates to the possibility that some members did not receive their ballots in time, especially outside of the United States and Canada. Ballots were returned from all continents and major regions where we have members except for South America (the only one from Africa came in too late to be counted). Did you receive your ballot too late to return it? We really want to know if you had this problem so that we can plan future time-sensitive mailings to take regional postal delays into account. Please contact us (you can remain anonymous if you wish) by post card or other means!

If there are other reasons that you may not have returned the ballot, we would like to know that as well. Do you feel left out of the election process (under-represented, too far afield to participate, think it doesn't matter, etc.)? We want to make the Division as relevant to *you* as possible, but we can do that only if you let us know your problems and concerns. *Please* let us know.

— Doug Peters  
1992-1993 Nominations Chair

gy was selected to kick off the program as it was believed that there were enough coal geologists around to make this a viable beginning. Other EMD members should not feel left out just because coal geology was selected as a beginning. If the program is successful, it will be enlarged to include other non-petroleum specialties. Coal, for the purposes of this certification program, is broadly defined and includes peat and lignite. The limits of the term "coal" have not been set precisely yet, and any input would be helpful.

Requirements for becoming a Certified Coal Geologist (CCG) were modeled after DPA's CPG program. Following is a brief list of requirements an applicant must meet to be certified:

- 1) The candidate must be a member in good standing of AAPG and EMD and a member of EMD for one year prior to applying for certification.
- 2) The candidate must possess an undergraduate or graduate degree in geology or a related field.
- 3) Eight (8) years experience working as a coal geologist are required for certification. This should be broad-based experience and not confined to one specialty. One year of experience will be granted for a masters degree and an additional year for a Ph.D.
- 4) A total of eight sponsors/references are needed: 3 CCG's, 2 non-member professional geologists, and 3 responsible community leaders to attest to the candidate's good character.

Certification will be through DPA's Certification Committee, which has been expanded to include CCGs, who will handle CCG applications. This arrangement will allow maximum flexibility for future expansion without the complication of another board. Initially, due to a lack of CCGs, CPGs will be acceptable as sponsors, as will certified members of other geoscience societies, if they meet the CCG requirements. Fees, and there will be some to offset administrative costs, will not be excessive and will be split between DPA and EMD. Currently, coal-conscious CPG's are being recruited for an undefined length of time to serve on the certification committee.

A legal snag has developed since the New Orleans meeting. It appears that, under the current Bylaws, the Association is only permitted to certify petroleum geologists. This problem cannot be rectified by the AAPG House of Delegates until the next annual meeting in Denver. (What was it the bard said about lawyers?) EMD is planning to make good use of this time and should have all the necessary mechanisms and paperwork ready prior to the Denver meeting.

The EMD Coal Geologist Certification Committee would like to express their appreciation to Pat Gratton, chairman of DPA's committee created to interface with EMD's Certification Committee on the certification process, and Chuck Noll, President of DPA. Without their enlightened help, this program would never have gotten off the ground. Anyone with comments, questions, or a burning desire to volunteer for committee work should contact me at the West Virginia Geological Survey (304-594-2331). The committee will submit updates to the newsletter to keep the membership informed of progress. See you in Denver!

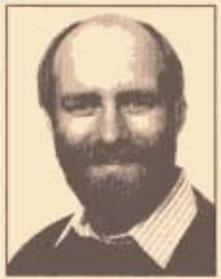
— Mitch Blake  
Chair  
Coal Geologist Certification Committee

## EMD NATIONAL AWARDEES FOR 1992-1993



Daniel Yee

Daniel Yee and co-authors John P. Seidle and William B. Hanson received the EMD Best Paper Award for their oral paper "Gas Sorption on Coal" given at the 1992 Annual Meeting in Calgary.



Jon Dudley

Jon S. Dudley and co-author Craig H. Moore received the EMD Best Poster Award for their poster paper "Coupled Reaction Transport Modeling of Oil Sand Steam Simulation" given at the 1992 Annual Meeting in Calgary.



Ruffin Rackley



Robert Fuchs

Distinguished Founders Awards were given to Ruffin I. Rackley and Robert L. Fuchs for their service to EMD in helping found the Division and various volunteer activities since then.



Andrew Scott



Marilyn Segall

Certificates for Excellence in Presentation were presented to Andrew R. Scott and co-author William A. Ambrose for their paper "Thermal Maturity and Coalbed Methane Potential of the Greater Green River, Piceance, Powder River, and Raton Basins," and to Marilyn P. Segall and co-authors Janina K. Rafalska and S.A. Kuehl for their poster "Organic Matter Distribution in Fine-Grained Deltaic Sediments: A Physical-Geochemical Investigation of Kero-gen Microhabitat."



William Chenoweth

William L. Chenoweth received the EMD Distinguished Service Award for his past and present service as Nuclear Minerals Councilor, present service as Rocky Mountain Section Councilor, and numerous other volunteer activities within EMD, especially for writing the Nuclear Minerals annual developments articles published in the AAPG Bulletin.

Michael A. Wiley (photo not available) received a Certificate of Merit for his efforts as Best Paper and Poster Awards Chairman for the 1991 Annual Meeting in Dallas, for selecting and coordinating judges, and for efforts to improve the paper judging process for EMD in general.



Douglas Peters

The EMD Past President's Award was presented to Douglas C. Peters for his service on the EMD Executive Committee as President (1991-1992). He also received a Certificate of Merit for his three-year editing effort on the EMD book, "Geology in Coal Resource Utilization," published in early 1992.



Carroll Knutson

A Certificate of Merit was presented to Carroll F. Knutson for his many years of service to EMD as Oil Shale Councilor, especially for his work on the annual Oil Shale developments articles published in the AAPG Bulletin.



Ned Gilbert



Syed Hasan

E.E. "Ned" Gilbert was presented a Certificate of Merit for his work on the 1992 Annual Meeting in Calgary as EMD Vice-Chairman and General Technical Program Chairman. Syed M. Hasan was presented a Certificate of Merit for his work on the 1992 Annual Meeting in Calgary as EMD Best Paper and Poster Awards Chairman and for coordinating and selecting judges.

## RECENT PUBLICATIONS OF INTEREST

**Clarke, Lee,** 1992, Applications of coal-use residues: IEA, Coal Research Publication, 406 p. (avail. from Ms. Theresa Wiley, Univ. of Kentucky, CAER, 3572 Iron Works Pike, Lexington, KY 40511-8433, Telephone: 606-257-0308, Fax: 606-257-0302)

**Ettensohn, F.R., and R.T. Hendricks,** 1992, Core logging manuals for Eastern oil and gas shales: IMMR Highlights, v. 11, no. 4, p. 3-4.

**Finkelman, R.B., S.J. Tewalt, and D.J. Daly,** eds., 1992. Geology and utilization of Fort Union Lignites: Reston, Virginia, Environmental and Coal Associates, 22 papers. (Available from ECA at P.O. Box 3168, Reston, VA 22090. Cost is \$35 for 4th Class postage, \$37 for 1st Class, and \$45 for overseas mail. Note that all profits from this book will be donated to the American Coal Foundation to aid in their educational activities. Contains comprehensive discussions of the geology, coal quali-

ty, characteristics, and utilization of the lignites in North and South Dakota, Montana, and Saskatchewan. Other topics include hydrology, environmental and regulatory issues, and lignite production summaries. Conventional and innovative lignite-based technologies are described in detail.)

**Imbrogno, Philip J.,** 1992, Receive satellite images on your computer: Earth, v. 1, no. 3, p. 58-65.

## VIEWS OF EMD AT THE 1993 NEW ORLEANS MEETING

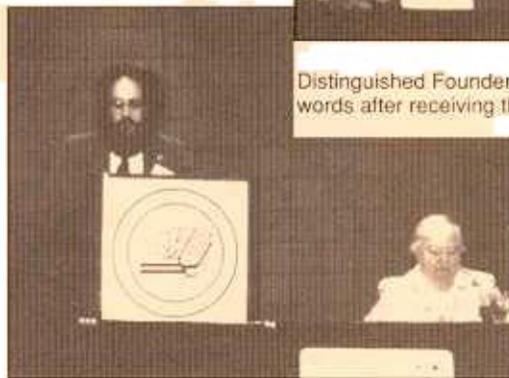
(photos courtesy of Carroll Knutson)



View of the grand EMD booth in the exhibit hall at the April 1993 meeting. The booth materials were organized and transported to the meeting from the West Virginia Geological Survey by member Ken Ashton (standing in center of group at booth). President Carl Smith, Scott McColloch, and others at the WVGS also had a hand in putting the booth together. Others present are 1994 EMD Technical Program Chair Peter McCabe, incoming President John Gabelman (partially hidden) at left, and Doug Peters at right.



Distinguished Founder Awardee Robert Fuchs says a few words after receiving the award from President Smith (at left)



1993 Annual Meeting EMD Vice-Chairman Mike Fein relates his experiences in preparing for the meeting and introduces speaker Dr. Ray (at right).



Daniel Yee and William Hanson being presented the EMD Best Paper Award by President Carl Smith at the Annual Awards Luncheon. Sam Friedman is at the podium announcing the awards, while luncheon speaker Dr. Dixie Lee Ray looks on at right.



The second largest number of EMD Luncheon attendees heard Dr. Ray "tell it like it is" about the status of and portents for environmental overreaction to man-made and natural conditions and "pollutants". Looking on from left are incoming EMD President John Gabelman, AAPG President Harrison Townes, and EMD President Carl Smith. A record 300 attendees heard Dr. Edward Teller's unforgettable speech in San Francisco in 1990.

## UPCOMING MEETINGS

- 1) **Coal-tar and Petroleum Pitch Composition, Applications, Toxicology, and Future Roles: Short Course;** September 26-October 1, 1993; Carbondale, Illinois: For more information, contact Jane O. Evans, Division of Continuing Education, Southern Illinois University, Carbondale, IL 62901-4324, Telephone: 618-536-7551, Fax: 618-453-5680.
- 2) **Second Thematic Conference on Remote Sensing for Marine and Coastal Environments: Needs, Solutions, and Applications;** January 31-February 2, 1994, New Orleans Marriott, New Orleans, Louisiana: This unique conference focuses on applying remote sensing and GIS to solve real-world problems in marine and coastal environments. Contact ERIM/Marine Environment Conference, P.O. Box 134001, Ann Arbor, MI 48113-4001, Telephone: 313-994-1200 (x3234), Fax: 313-994-5123.
- 3) **7th Australasian Remote Sensing Conference: Mapping Resources, Monitoring the Environment, and Managing the Future;** March 1-4, 1994; Melbourne, Australia: "This conference aims to explore the relevance of remote sensing to current and future problems, including the exploitation of natural resources and the long-term protection of the Australian and world environment." Held in conjunction with the Inter-Congress Symposium of Commission 5 of the ISPRS, the 2nd Australian Photogrammetric Conference, and the Pacific Ocean Remote Sensing Conference (PORSEC '94). Contact 7th ARSC Conference Secretariat, P.O. Box 29, Parkville, Victoria 3052, Australia, Telephone: 03-387-9955, Fax: 03-387-3120, E-mail: 7arsc@dar.csiro.au.
- 4) **The International Land Reclamation and Mine Drainage Conference and Third International Conference on Abatement of Acidic Drainage: combined conferences;** April 25-29, 1994; Pittsburgh, Pennsylvania. Contact Debbie Lowanse or Bob Kleinmann, U.S. Bureau of Mines, P.O. Box 18070, Pittsburgh, PA 15236, Telephone: 412-892-6708, Fax: 412-892-4067.

## CALL FOR EMD PAPERS FOR 1994 ANNUAL MEETING IN DENVER

We are planning another great set of EMD technical sessions for the 1994 Annual Meeting to be held in Denver on June 12-15. The theme for the meeting is "Analogues for the World." I would like to invite all of you to submit abstracts for quality poster and oral papers at the meeting. The following are the planned EMD sessions (the numbers refer to session numbers listed in the general Call for Papers):

### Oral/Poster:

- 38) Future of Energy—An Energy Minerals Perspective
- 39) Environmental Impact of Energy Mineral Production and Use

### Poster Only:

- 7) Remote Sensing and Surface Methods in Exploration
- 33) Energy from Shale (oil and gas shales)
- 34) Rocky Mountain Coal

Other subjects are welcome as well if your topic doesn't quite match these titles.

Abstracts are due to AAPG by November 1, 1993. For more information on these sessions, please contact me (telephone: 303-236-0772, Fax: 303-236-0828, E-mail: [petersd@drc.usbm.gov](mailto:petersd@drc.usbm.gov)) or our Technical Program Chairman, Peter McCabe (telephone: 303-236-7550, Fax: 303-236-7738). For more information on the meeting in general, please contact AAPG (918-584-2555).

We will have information on the proposed short courses and field trips in the next newsletter.

Doug Peters  
1994 Annual Meeting EMD Vice-Chairman



AAPG ANNUAL MEETING

Analogues for the World

## CALL FOR PAPERS FOR AAPG INTERNATIONAL MEETING



1994 AAPG International  
Conference & Exhibition  
August 21-24, 1994

Abstracts for oral and poster presentations for the 1994 AAPG International Conference & Exhibition in Kuala Lumpur, Malaysia on August 21-24 are due to AAPG by September 1, 1993. The theme for the meeting is "Southeast Asian Basins: Oil and Gas for the 21st Century." Send to

1994 International Abstracts, AAPG Convention Dept., P.O. Box 979, Tulsa, OK 74101-0979 or fax to 1-918-584-2274 (and follow up with an original sent by mail).

Of particular interest to EMD members is the topical area of Gravity/Magnetics and Remote Sensing in Rugged Jungle Terrains. However, papers on any of the topical areas within the general categories of Plate Tectonics and Basin Fundamentals, Exploration, Development and Production, and Geoscience Computing are welcome.

Contact AAPG for more information on the meeting.

## CANADIAN OIL SHALE CORRECTIONS

The following material is included as corrections to the article on Canadian oil shale activities in the March issue of *The Energy Minerals Geologist*:

- 1) Central Pacific Minerals HL of Australia should have been called "Southern Pacific Petroleum NL/Central Pacific Minerals NL of Australia."
- 2) The following material should be substituted for the paragraph on the AOSTRA Taciuk Processor: "The Alberta Oil Sands Technology and Research Authority (AOSTRA) has financed the development of the AOSTRA Taciuk Process, in which the Processor is the key component. AOSTRA describes the Processor as a "horizontal rotating vessel composed of two concentric cylinders which create separate processing zones." The various types of retorts developed elsewhere generally extract kerogen from oil shales by burning some of the kerogen to heat the shale. The first vapors driven off as the shales

are heated, therefore, are the low boiling-point hydrocarbons, the propane, butane, and ethane—the most valuable parts, and the ones used as a heat source. However, in the AOSTRA Taciuk Process, the fixed carbon remaining in the shale, after the kerogen is pyrolyzed (thermally cracked) and drawn off as a product vapor, is used as a heat source."

- 3) UMA Engineering should have been called UMATAC Industrial Processes.
- 4) The C\$20/bbl cost quoted for distillate production was only for the operating cost of the Taciuk Process. The cost does not include capital costs of the AOSTRA Taciuk Process or the capital or operating costs of hydrotreating to produce a marketable synthetic crude oil.

— W.H. Tisdall  
Vice-President, Production  
Burning Rock Oil Co. Ltd.

## EMD AT THE 1993 ROCKY MOUNTAIN SECTION MEETING

The 1993 Rocky Mountain Section Annual Meeting will be held on September 12-15 in Salt Lake City, Utah. EMD will be a prominent part of the meeting, with a luncheon and poster session on the first day of sessions and an oral session on the second day.

The poster session will feature the following EMD papers: Geology and methane content of the Book Cliffs coal field; A new regional appraisal of the coal resources of the Henry Mountains coal field, Emery, Wayne, and Garfield counties, Utah; Cleat and joint patterns in some Cretaceous coal sequences in Utah and their regional implications; and Coalbed methane in Utah, New Mexico, Colorado, and Wyoming: Resources, reserves, and production. The oral session will contain the following papers: The United States uranium industry, 1993; Coal-bed methane exploration and development in Utah; Improved procedures for collection and interpretation of coal gas reservoir gas content and natural fracture geometry data; The transition between the low-rate and the high-rate producing areas of the Fruitland Coal, San Juan Basin, New Mexico; Retention of methane in Utah coals; Stratigraphic and depositional setting of Fort Union Formation on the northeast flank of the Rock Springs Uplift, Wyoming; Geothermal potential of southwest Utah; and Status and potential of the U.S. geothermal industry.

The EMD Luncheon on September 13 features Dr. Merrill K. Ridd, Professor at the University of Utah and Director of the Center for Remote Sensing and Cartography at the University of Utah Research Institute. He will speak on "The Future of Remote Sensing for Earth Science Applications," where he will review the state-of-the-art of image processing and interpretation, speak about current Federal and academic R&D efforts, and suggest how the science may evolve during the coming decade.

Plan to attend this informative meeting! Also, we encourage all EMD members who will be attending to volunteer for judging EMD poster and/or oral papers for the Best Paper/Poster awards. This activity takes relatively little time, is easy, and helps EMD reward the efforts of our authors and recognize their technical work.



1993 AAPG-SEPM-EMD-DEG  
ROCKY MOUNTAIN SECTION MEETING

## ACCESSING THE EMD CONNECTION

If you have the necessary hardware and software, to use the EMD Connection (our computer bulletin board) you need to:

- 1) Set up your communications software for 300, 1200, or 2400 bps, no parity, 8 bits, and 1 stop bit. This often is abbreviated as 1200-N-8-1 or 2400-N-8-1 or some similar combination, depending on your communications software. The number of bps, sometimes referred to as "baud", automatically will be sensed by the BBS.
- 2) Dial 304-594-3547. The BBS will answer and the modems will exchange some information in the form of tones. At this point, your modem will inform you that it has connected at the communication speed (bps or baud rate) that you set up.
- 3) Type a couple of carriage returns for the software to use to determine this speed on the other end. You then will receive a welcome message that will include a short message from me.
- 4) Type NEW as instructed if you are a new user. (After an account is set up, type your user name and password.) After you type "new", the BBS will print several paragraphs to read and ask you a series of questions. At the end of this, you will receive an electronic mail message from me that includes an "attached" file.
- 5) Read the message by typing ERT (this concatenated command stands for "E-mail Read To you"). This will display some header information and ask if you would like to read the message by typing R. Do this and read the message. You then will be given the opportunity to download a file of user information named NEWUSER.TXT. Both the initial welcome message and NEWUSER.TXT will include information that I will keep up to date. I will make sure that NEWUSER.TXT also is available in a library file for experienced users. Please fill out the registry of users as soon as possible. This is a public information listing that can be used to find out a little about other users on the BBS. Information in the registry can be updated by you at any time.

G.H. "Scott" McColloch  
EMD Connection SYSOP

## HOW TO SUBMIT MATERIAL FOR THE NEWSLETTER

We encourage you, the EMD member and/or reader of the EMD newsletter, to submit short notices and articles (in suitable form) for publication in the newsletter. These can include commodity/industry news notes and press releases, product announcements in areas of EMD topics, book reviews, employment changes, member news, geological software reviews, and any other items which would be of general interest to EMD members. We prefer to receive such articles on IBM-compatible diskettes (which will be returned), but letters or legible faxes are okay. Mailed and faxed material should be sent to Doug at the U.S. Bureau of Mines, P.O. Box 25086, Bldg. 20, Denver, CO 80225, Fax: 303-236-0828. Doug also can receive material via INTERNET at mailbox petersd@drc.usbm.gov. Call Sam at (405) 325-3031 or Doug at (303) 236-0772 for more information on submitting material. General comments and suggestions can be addressed to us as well.

Doug Peters  
Sam Friedman

### THE ENERGY MINERALS GEOLOGIST

Newsletter of the Energy Minerals Division of the AAPG  
Volume 4 • Number 4 • June 1993  
Published by the American Association of Petroleum Geologists  
P.O. Box 979  
Tulsa, Oklahoma 74101-0979

#### Energy Minerals Division

**President**  
Carl Smith  
West Virginia Geological Survey  
P.O. Box 879  
Morgantown, WV 26507-0879  
(304) 594-2331

**Vice-President**  
John W. Gabelman  
John W. Gabelman and Associa:  
23 Portland Court  
Danville, CA 94525-4317  
(415) 837-5989

**Secretary/Treasurer**  
Frank D. Pruett  
Indiana Geoscience Institute  
P.O. Box 6222  
Bloomington, IN 47407  
(812) 333-0331

NON-PROFIT  
ORGANIZATION  
U.S. POSTAGE  
PAID  
TULSA, OK  
PERMIT NO. 979