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AIPG ANNOUNCES 1992 AWARD RECIPIENTS

COVER - Dale Nations (standing, rear) and teachers from reservation schools at Grand Canyon National Park, Arizona.

Photo by Robert L. Swift, CPG-6364 - article on page 5.

DEPARTMENTS

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MEMBERS IN THE NEWS

NEW MEMBERS, APPLICANTS, ETC.
SPECIAL REPORT

GEOSCIENCE EDUCATION, CONTINUING EDUCATION, AND CAREERS

Part 1

Teachers from reservation schools on field trip to the Teapot area 40 km south of Window Rock, Arizona. The cliff is an exposure of Jurassic collian and fluvial sandstone and the Cretaceous Dakota Formation.
A Geoscience Education Collaboration

J. Dale Nations, CPG-6364, Regents Professor of Geology and
Robert L. Swift, Adjunct Professor of Physics, Northern Arizona University

As any who have maintained an awareness of pre-college geoscience programs can attest, earth science education has endured a long period of neglect and misuse. At the same time, a decline in the effectiveness of America’s pre-college science programs has been widely reported. As a consequence, the number of motivated, qualified, young people entering geoscience programs in the universities has dwindled. Fortunately, there appear to be signs of reversal in some of these trends - at least locally. This article discusses on the role two of us are taking in using the earth sciences as a fulcrum for enhancing both interest and performance of pre-college teachers and their students in the physical sciences.

One writer (Nations) is an AIGC-certified and state-registered professional geologist serving on the faculty of Northern Arizona University in Flagstaff and hence engaging in a familiar range of scholarly activities: research, publication, teaching, and advisement of undergraduate and graduate students. The other (Swift) is an adjunct professor of Physics and Astronomy who began his career with a B.A. degree in geology, followed by a number of years teaching sciences at the pre-college level, working in teacher enhancement programs, and developing science curricula. The two of us met through common interests and are cooperating in a number of projects that neither of us could undertake individually. While we cannot prescribe a universal formula for such cooperative ventures - local opportunities and individual capabilities are too diverse - we hope that by mentioning a few of our experiences we can encourage AIGC members and other professional geologists to examine their opportunities for similar involvement in activities to contribute to the improvement of earth science education.

For the past several years, Nations has served on the Advisory Board to the Arizona State Geological Survey for Earth Science Education. In this capacity he supported a recently-enacted change in the Arizona Board of Regents policy on college preparatory laboratory sciences that previously had not considered Earth Science to be equivalent to Biology, Physics, or Chemistry.

As a consequence of the reinstatement of Earth Science, we expect an increasing number of high schools to
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develop and offer such courses, and we want to help. We’re convinced of the inherent value of Earth Sciences as a reality-based springboard into the more abstract topics of chemistry, physics, and biology but recognize the need for maintaining rigor as new Earth Science courses are developed. Thus, we are collecting sample texts and lab manuals, researching exemplary curricula and examinations developed by the AIGPG and the American Geological Institute, and searching for potential governmental and private-sector funding opportunities to support teacher involvement in Earth Science curriculum development. Through the Arizona Science Teachers Association, we have announced our eagerness to help and have solicited input from teachers who are experienced in teaching Earth Science courses.

This balance between professional expertise and grass-roots input is essential to any effective educational reform effort. Without it, success is unlikely. At the present time, the two of us are completing the first cycle of a program developed with substantial teacher input, Earth Science in Elementary Schools. Our primary support for the program has been provided through the component of the Eisenhower Mathematics and Science Education Act, administered by the Arizona Board of Regents. Annual competitions are held in each state, and our proposal was funded in the amount of $95,000 to work for a year with teachers of Native American students. The funding, supplemented by an equipment donation from the Mobil Oil Corporation, included stipends, registration fees, and materials for 30 teachers who attended Northern Arizona University for two weeks of classroom work, labs, and local field study. This experience was followed by a three-day field trip around northern Arizona to apply the principles and techniques learned in the classroom to geology, astronomy and meteorology in the vicinity of their school settings on the Navajo and Hopi reservations. Because our teachers were all experienced in the classroom, there was no need to attempt telling them how to teach. Since they serve in a wide range of grade levels (K - 8) we de-emphasized presentation of specific activities for them to use with their classes. Instead, we concentrated on providing a basic knowledge of principles of meteorology, geology, and astronomy, then left individual teachers to develop appropriate methods of presentation to their own classes.

The results have been little short of phenomenal, and on our site visits to participating schools we have been treated to a range of activities we would never have thought to suggest. Teachers in two schools 60 miles apart have initiated a series of pen-pal science activities and exchange visits between their classes. Several teachers have set up backyard nature study areas, and one has obtained a grant to develop a petrified forest mini-park on school-owned land. What better way to teach students the difficulty of protecting an environmentally sensitive area that you will encourage large numbers of people to visit?! Two teachers took their classes on a five-day field trip to a remote area in the western Grand Canyon, helped by a generous donation of helicopter time by a local scenic flight company to fly in supplies. A wide variety of in-class experiences have sprung up, ranging from hands-on lab work to comparisons of traditional Navajo descriptions of natural phenomena to those derived from Western European tradition.

In the course of our site visits to the Navajo and Hopi reservation schools, we have been led to localities we’d long intended to visit but hadn’t
gotten around to, as well as to field sites of unsuspected interest. As we have come to recognize, there simply isn’t time for fully-trained professionals to scour every square meter of our state. But once a few dozen teachers have had their interest aroused, there will be thousands of their students who do have the energy to serve as our remote observers. Perhaps we can involve them in our research interests on reservation land, and to explore other research topics, especially those of environmental significance.

A recent three-day capstone experience at nearby Grand Canyon National Park provided all participants with the opportunity to camp out together again; learn some more geology, weather, and astronomy; compare experiences; and plan for the future.

Among our ideas still under development is assessment of the economic potential of a nearby energy resource. A planning grant from Mobil Oil Corporation, administered by the Northern Arizona University Office of Native American Programs, has supported our development of a major proposal to NSF, under which graduate and undergraduate students would learn geology by exploring an as-yet unresolved question over a five year period. A closely related program is being planned through which pre-college students could prepare themselves for participation in college-level projects by learning basic geologic principles and techniques of observation and description, as well as mapping and field skills. And then there’s the Triassic phytosaur site a high school teacher led us to. Some day, soon we hope, we’ll find the funding to involve high school students in its recovery, preparation and display, as well as other fossils from reservation land.

As the two writers continue their association, we find ourselves continuously on an exciting, synergic, interface between complementary realms of the professional geologist and the teachers of young people who will one day replace us. We recommend a collaboration such as our own to all who are concerned with the geosciences.

J. Dale Nations is Regents Professor of Geology at Northern Arizona University in Flagstaff, Arizona. Robert L. Swift, Adjunct Professor of Physics at the same institution, will soon return to high school teaching in a reservation school.
Ten Commandments For Working With Schools

Linda E. Okland, CPG-7117, Anchorage, Alaska

The following comments are offered as guidelines for those interested in getting involved in K-12 education. They apply to many varieties of involvement, from making a presentation in your child's class to changing a state's entire science curriculum.

Above all else, remember the Golden Rule as applied to Educational Partnerships: Respect Your Partners. Be especially careful not to be condescending and to avoid stereotyping. Work together with educational partners. Don't fall into the trap of trying to tell them how to do their jobs. They don't like it any more than you do.

There is a tendency for folks to think that, because they were students, they know all about education. This makes about as much sense as saying that living through an earthquake makes you a seismologist! Education specialists today know a great deal about how people learn and what techniques work in various situations. There is an extensive body of educational research. Most geologists are about as familiar with this research as most teachers are with seismology.

Several excellent sources of information are available for those interested in "bouncing up" on current thinking in education. There are many resource materials helpful to "visiting geologists" working with K-12 classes. The organizations listed below can help you get started.

THE COMMANDMENTS

1. **Be thou trustworthy.** Schools are often besiegued with special interest groups wanting their pet project adopted or offering materials or gimmicks. It often takes time to establish your credibility and to convince educational partners that you really want to help them, not just advance some private agenda. You can often do this by volunteering to work on PTA fund-raisers, science fairs, etc.

2. **Do thy homework.** Find out what programs are currently in place and/or pending before proposing changes. This step is analogous to doing a literature search before starting a research project, and it can save a lot of embarrassment as well as effort down the road. One well-meaning local geologist stated emphatically at a meeting that "We need to teach Earth Science in all of the high schools in town and we need to get qualified teachers to do it!" He was unaware that all of the local high schools already offered Earth Science and that many of the classes were being taught by individuals with master's degrees in geology or geophysics. It is also important to have a well-prepared proposal if you are urging curriculum or program changes. Even short classroom presentations benefit from careful planning and preparation.

3. **Know thy friends.** Research the decision-making process for the schools. Find out who makes decisions important to your programs and who the real "movers and shakers" are. Try to work through channels as much as possible. If your local schools have a curriculum advisory group, consider volunteering to serve on it.

4. **Know thine enemies.** It is essential to correctly identify any roadblocks and develop a plan for dealing with them. Common roadblocks include both policies and attitudes inimical to geological studies. In the example in #2 above, the problem was not a lack of courses or qualified teachers, but policies that dis-
courage students who received A’s or B’s in science from taking Earth Science.

5. **Know thyself.** Focus on what you do best. Work with teachers to explain what your expertise is and to find ways to share it with students. Generally speaking, they will be most interested in examples of what you actually do on the job. These can often be used as the basis for simulation activities, such as mapping activities or mock lease sales, which provide wonderful learning experiences for kids.

6. **Know thine audience.** Make sure your presentations, materials, and activities are appropriate for your audience. Confer with the teacher about the ages and the abilities of the students involved. Remember that hands-on activities are more effective than lectures at all age levels.

7. **Be thou forthright.** Communicate your plans and expectations clearly. Make sure responsibilities are clearly delineated. Notify your partners promptly if there is a change of plans or if problems develop.

8. **Be thou persistent.** Don’t be discouraged if things don’t work out perfectly at first. Analyze problems and make changes as needed, but keep trying!

9. **Both a learner and a teacher be.** Be alert for what you can learn as well as what you can teach. Kids have a wonderful way of giving you a whole new perspective on what you do. Teachers can often suggest new avenues for collaboration once they get to know you and understand what you have to offer.

10. **Enjoy thyself!**

**Sources and Resources**

- Alaska Minerals and Energy Resource Education Fund, P.O. Box 190927, Anchorage, AK 99519-0927: education kits
- American Association for the Advancement of Science, Project 2061, 1333 H St., N.W., Washington, D.C.: "comprehensive, long-term initiative to transform science, mathematics, and technology education"
- American Geological Institute, National Center for Earth Science Education, 4220 King St., Alexandria, VA 22302-1507: variety of publications, including resource list and education planning guide
- Association for Supervision and Curriculum Development, 1250 N. Pitt St., Alexandria, VA 22314: many high-quality publications on a variety of educational topics
- Geological Society of America, Coordinator for Educational Programs, P.O. Box 9140, Boulder, CO 80301-9140: partnership program and materials

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Geoscience Education In Technology Transfer: A West Africa Case Study

Solomon A. Isiorho, CPG-7783, Department of Geosciences, Indiana University, Purdue University, Fort Wayne, Indiana 46805

The transfer of western technology to developing nations, such as those in Africa, has met with mixed success. A problem with the transfer is that the technology is inappropriate for the developing nations. In many cases, the technology does not suit the local people because they lack the expertise and experience to handle it. Experience has indicated that any technology transfer should take into account the place, the people, and the condition of the area to which the technology is going. This paper discusses a project that took place in Central Africa in which technology transfer was successful. It identifies the key elements that led to success.

Water is a major issue in Central Africa, especially within the Sahel region. There have been several studies to identify sources of potable water for the people of Central Africa (Isiorho, 1992 and references therein). In an attempt to provide water, or locate water sources, some technologies were introduced which were easily mastered by the 'local scientist' with tools that could be easily fashioned and maintained using local material. The purpose of the project in the Sahel (Lake Chad) region (shown in Figure 1) was to locate potable water resources and to understand the hydrology in order to formulate effective water resources management programs. Towards this end, several methods were proposed and used in order to understand the hydrology. These methods included the use of seepage meters to measure the transfer of water between surface water and groundwater, minipiezometers to measure flow directions, point dilution tests (from an open 'well') for the determination of ground water flow rate, water analysis for water quality, a resistivity survey to determine the depth to ground water and the mapping of fractures, tapes to measure the depth to groundwater in wells in order to compile a water table map of the region, and hydrogen and deuterium isotopes to trace the surface water within the groundwater system. Detailed discussion of the various methods can be found in the paper by Isiorho and Matisoff (1990). These methods were selected in order to find some answers to questions such as: where is the water in the basin, what is the quality of the water, and how could this resource be managed?

In the above methods, several materials that are readily available were used. For example, the seepage meters were made from readily available local materials such as steel drums with some plastic tube and cellophane bags as described by Lee (1977) and as shown in Figure 2. Other instruments used included small diameter plastic pipes or 'PVC' pipes which were used as minipiezometers to measure the water level and flow direction in the ground. Common table salt was introduced to the center pipe and the surrounding pipes monitored for the salt using a cheap specific ion electrode. (I found out that
a common electronic test kit, such as a battery tester, could be used when a large quantity of salt was used.) The plume of the salt shows the flow direction of the ground water. The depth to ground water was measured in open wells from which a water table map was plotted. The well data were combined with data from resistivity surveys using a Strata Scout resistivity meter and Terrameter. These pieces of "equipment" were used in the study in addition to some fairly sophisticated instruments such as UV Spectrophotometer, Scanning Electron Microscope, and an Atomic Absorption Spectrometer, some of which were available in the local colleges.

In addition to the use of the simple but efficient low tech equipment, some local students and scientists were incorporated into the project in the summer of 1991. These local people were allowed access to the equipment and took part in both the construction of the equipment and measurements that were made in the project.

In the field, the students were involved in the measurement of the depth to water in open wells from which the water table map was constructed. The electrical resistivity method was used to delineate lineaments that were derived from satellite images. The method of image interpretation was briefly introduced but not sufficiently for the students to master. Water samples were also collected by the students, and the students were shown how to handle samples and prepare them for analysis or shipping. Routine water analyses were performed in the field using pH, conductivity, and TDS meters. Test kits were also used in the field for the measure of alkalinity, acidity, and iron. A portable spectrophotometer was also used to determine some ions in the field, but most of the cations were analyzed in the laboratory using an Atomic Absorption Spectrophotometer. The students had some feel for the water quality of the area of study.

At the end of this particular project, the students were asked to write a term paper stating the objective of the project, methods used, data collected, interpretation, suggestions for future studies, and conclusions. A paper, partially based on some of the data collected by the students, was published in the proceedings of the Symposium on the Application of Geophysics to Engineering and Environmental Problems (Isiorho, et al, 1992).

Four months after the field project, about 50% of the students later chose research projects related to the project using local materials to which they were exposed. Some of the local officials have also started some projects using some of the knowledge acquired during this project.

The students were particularly grateful for the hands-on experience gained from this project. The local scientists were also involved and got some idea as to the type of local materials that could be used by modifying some of the western technology. This work, sponsored by Earthwatch Research Corps., The National Geographic Society, and Indiana University - Purdue University at Fort Wayne (IPFW), proved to be successful in technology transfer to the local people who are probably best suited to deal with most of the problems of the region. The involvement of the locals and the agencies also proved very useful in the transfer. Technology transfer should look at the people that may be involved, the availability of materials, ease of use and transfer time as demonstrated in this case study.

Geologic research that incorporates local students, and sometimes officials, is a good avenue for technology transfer from the West to developing nations.

Acknowledgment
My thanks to K.S. Taylor-Wehn, the University of Maldaguri geology students, and the 91 Lake Chad Earthwatch volunteers for a successful field season. My thanks also to Chad Basin Development Authority, Lake Chad Basin Commission, and Prof. Argast for their encouragement.

References


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Editorial: Geoscience Education

Students at South Dakota School of Mines and Technology enrolled in GEOE 782 (Plural Processes) discover that the Niobrara River isn’t everywhere a braided channel. A four-day canoe trip is required for this course, giving students field examples of natural and applied geomorphology and hydrogeology.

Perry H. Rahn, CPG-3724, Dept. of Geology and Geological Engineering
South Dakota School of Mines and Technology, Rapid City, South Dakota 57701

Geoscience Education

Everything changes...the only unchanging thing is change itself...said Heraclitus the ancient Greek.

And so it is with career opportunities for the profession of geology. The change in the past decade has been from the more traditional fields of petroleum and economic geology to hydrogeology and environmental geology. Educational programs in the U.S. are being adjusted accordingly.

Probably the greatest field of career opportunities is in the area of waste siting and cleanup. As an example of the magnitude of the environmental cleanup facing this country, just consider U.S. government facilities waste. The Federal Facilities Compliance Act of 1991 mandates cleanup. With the diminution of a world-wide war threat, the Department of Defense (DOD) now turns its attention to the awesome problem of cleaning up 17,500 contaminated sites at 1855 state-wide military installations. The Department of Energy (DOE) anticipates it will take about 40 years and $200 billion to cleanup 3,000 sites at the 17 nuclear weapons facilities.

The public is increasingly aware of environmental issues. The media brings to attention daily incidents of contamination, battles over siting of landfills, midnight dumpers, etc. The public wants the environment protected. Students generally are concerned about the environment.

Most geoscience departments are responding to the awakening interest in environmental issues. For some smaller departments, this may mean only the introduction of a new course in "environmental geology" which may attract students majoring in other fields who are simply looking for a science elective and are not enthusiastic about the physical geology course. To other departments offering a B.S. in geology, courses in environmental geology and/or hydrogeology are being added to help strengthen the credentials of their graduates. Some schools, such as the University of North Dakota, now offer a B.S. degree in environmental geology as an interdisciplinary effort. Many departments throughout the U.S. are making a more concerted effort towards environmental geology, hydrogeology, or engineering geology and are offering separate "tracks" in
those specialties for the bachelor's degree.

Engineering geology includes both the fields of hydrogeology and environmental geology. Therefore, those schools offering engineering geology or geological engineering as a course or track find they are ideally situated to capitalize on the educational opportunities in these fields. At my school, South Dakota School of Mines and Technology, we find that students are interested in pursuing work through the geological engineering program at B.S., M.S., and Ph.D. levels.

Graduate programs now face the problem of having fewer B.S. degree candidates coming through the pipeline. Emphasis in graduate programs reflects increasing interest in hydrogeology and engineering geology. At Colorado School of Mines, unemployed petroleum geologists in the Denver area are able to fit into the M.S. hydrogeology program.

In summary, times are changing. I think AIPG needs to respond. AIPG, with its 4,500 members, has long been a bastion of traditional petroleum and mineral geologists. The editorials, letters-to-the-editor, and lobbying efforts of AIPG usually reflect a pro-development stance which runs counter to that of many young people interested in the environment. For example, AIPG Executive Director William V. Knight (March 1992 issue of the Professional Geologist, p. 22) reports "We believe that many environmental problems and misunderstandings are the subject of overkill in legislation and regulation . . ." Former AIPG President Haydn Murray (December 1991 issue, p. 8) reports, "AIPG worked diligently to try to keep the basic provisions of the 1872 Mining Law intact." AIPG needs to reconsider its traditional philosophy in view of the changes occurring in this country, and whether AIPG wants to risk alienating the younger set.

**AGI Publishes Curriculum Guide For Earth Science Content**

"Earth Science Content Guidelines K-12" is an 80-page guide for incorporating earth-science content into the precollege curriculum. Published recently by AGI's National Center for Earth Science Education, the guide consists of a set of questions organized according to the interacting systems that characterize Earth and its relationship to the Solar System. In each of the six content areas-Solid Earth, Air, Water, Ice, Life and Earth in Space-the questions are divided into these grade levels: K-3, 3-6, 6-9, and 9-12.

The content-guide report also has a large section of notes outlining ideas that teachers might want students to understand while investigating the questions. The notes, arranged in a three-column format, include suggestions for what teachers can do to help students acquire that understanding. Column headings are Essential Questions, Key Ideas, and Seeking Answers.

"Earth Science Content Guidelines K-12" is based on goals, concepts, and recommendations for improving earth science in the nation's schools, which are outlined in another publication, "Earth Science Education for the 21st Century: A planning Guide." AGI published that 40-page report earlier this year.

The planning-guide report discusses goals to guide earth-science education, essential concepts in earth science, recommendations for teaching earth science in grades K-12, and recommendations for implementing new precollege earth-science programs.

Both guides were developed by earth scientists, teachers, and other science educators with the support from the National Science Foundation and other contributors. Copies are available from the AGI Publications Center, Box 2010, Annapolis Junction, Md. 20701. Phone: (301)953-1744. Volume discounts are available for each publication.

For more information about the content of the guides or AGI's education program, contact Andrew J. Verdon Jr., Director, National Center for Earth Science Education, AGI headquarters.

The American Geological Institute is a professional association of 19 member organizations representing geologists, geophysicists, and other earth scientists.
Exciting Students About Science: What Role Can You Play as a Professional Earth Scientist?

Ed Geary, Coordinator for Educational Programs, GSA

By the time the majority of children growing up in the United States today reach 10th grade they do not like science. The most common responses as to why students don't like science are that “science is boring” and "science is too hard", and when questioned more closely, the majority of these students will also admit that they don’t see any real reason to learn science.

As earth scientists we probably have some difficulty understanding these comments. After all we study active volcanoes and landslide, we search for valuable energy and mineral resources, we reconstruct dinosaur skeletons, and we work on crucial environmental problems. Our work takes us to some of the most beautiful and exotic localities in the world including hot-spring communities on the ocean floor and glaciated mountains in Antarctica. How then, can students think science is boring or unimportant?

Insight is gained by taking a trip to visit a typical precollege earth science class. On our visit we discover that the teacher, although bright and creative, has no formal training in earth science. There is only a small amount of money for laboratory or classroom supplies, no money at all for field trips, and the teacher's sole earth science resource is an outdated textbook. We are also amazed to discover that the teacher is required to cover geology, oceanography, meteorology, and space science as part of the normal earth science curriculum, a task that most professional geoscientists would find difficult, if not impossible to do.

Several studies suggest that students learn science best when they actively participate in investigations of real-world scientific phenomena using hands-on and inquiry-based pedagogues, but given the realities of today's earth science classrooms, few students are likely to have these opportunities. How can we change this situation? One obvious solution is to better prepare preservice earth science teachers, and to offer in-service teachers more earth science enhancement opportunities and resources. Colleges and universities must play a major role in these efforts, but individuals can also offer valuable contributions.

As a concerned earth science society, AIGP would like to invite you to become involved in a new educational outreach program called Partners for Excellence. Coordinated by the Coalition for Earth Science Education and the Geological Society of America, this multiorganizational program is designed to match your scientific knowledge, interests, and concerns with the practical knowledge, insight, and teaching skills of precollege earth science teachers. By participating in this program you will learn how to effectively interact with teachers and students of various grade levels, receive support materials, and in effect become an earth science resource person for an earth science teacher or group of teachers from your community. To learn more about this program and how you can participate please contact Dr. Edward E. Geary, Coordinator for Educational Programs at the Geological Society of America, P.O. Box 9140, Boulder, CO 80301. Telephone: (303) 447-2020.

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US S 2994
AUTHOR: Rockefeller
TOPIC: BUSINESS AND CORPORATIONS
SUBTOPIC: BUSINESS TAXES - MISC.
SUMMARY: Extends the temporary suspension of duty on metallurgical fluor spar.
STATUS: 7/21/92 INTRODUCED.

US S 3127
AUTHOR: Johnston
TOPIC: ENERGY
SUBTOPIC: OIL, GAS, PETROLEUM
SUMMARY: Provides for the energy security of the nation through encouraging the production of domestic oil and gas resources in deep water on the Outer Continental shelf.
STATUS: 8/04/92 INTRODUCED.

US S 3149
AUTHOR: Bradley
TOPIC: RES. MGMT & PRESERVATION
SUBTOPIC: LAND
SUMMARY: Establishes a demonstration program to develop new techniques to prevent coastal erosion and preserve shorelines.
STATUS: 8/11/92 INTRODUCED.

US S 3168
AUTHOR: Sarbanes
TOPIC: RES. MGMT & PRESERVATION
SUBTOPIC: MINERALS AND MINING
SUMMARY: Amends the Surface Mining Control and Reclamation Act of 1977 to improve control of acid mine drainage.
STATUS: 7/9/92 INTRODUCED.

US H 5585
AUTHOR: Fazio, et al.
TOPIC: RES. MGMT & PRESERVATION
SUBTOPIC: LAND
SUMMARY: Establishes the US policy relating to wetlands.
STATUS: 7/9/92 INTRODUCED.

US H 5587
AUTHOR: Green
TOPIC: ENERGY
SUBTOPIC: ENERGY ISSUES - GENERAL
SUMMARY: Establishes a program to be known as the ADEPT Program for the provision of international assistance in the deployment of energy & energy-related environmental practices & technologies.
STATUS: 7/9/92 INTRODUCED.

US H 5609
AUTHOR: Owens, W.
TOPIC: BUSINESS & CORPORATIONS
SUBTOPIC: BUSINESS TAXES - MISC.
SUMMARY: Amends the Comprehensive Environmental Response Compensation, & Liability Act of 1980; establishes fault bases liability, numerical cleanup standards, & deadlines for remedial action, & amends the Internal Revenue Code of 1986; applies the Superfund minimum tax to additional corporations; provides additional revenue to carry out the Comprehensive Environmental Response, Compensation, & Liability Act of 1980.
STATUS: 7/9/92 INTRODUCED.

US H 5766
AUTHOR: Kostmayer
TOPIC: ENERGY
SUBTOPIC: NUC. ENERGY & RADIOACTIVE SUB.
SUMMARY: Requires the promulgation of standards for the cleanup of radiologically contaminated sites.
STATUS: 8/04/92 INTRODUCED.

CO 2561
AGENCY: Dept. of Natural Resources/Mined Land Reclamation Board
TOPIC: RES. MGMT & PRESERVATION
SUMMARY: Implements the Ground Water Protection Program for mining & prospecting operations through the Mined Land Reclamation Div.; provides criteria for establishment of points of compliance, requirements for ground water monitoring & definitions.
AGENCY CONTACT: Mineral Program Supervisor, Mine Land Reclamation Division, 1313 Sherman St., 215 Centennial Bldg., Denver, CO 80203-2273
CITATION: 2 CCR 407-1 Rules 1 & 8 Mining & Prospecting Operations: Ground Water Protection EFFECTIVE DATE: 6/10/92
COMMENT DEADLINE: 8/17/92
HEARING DATE: 8/27/92

FL 10672
AGENCY: Dept. of Environmental Regulation
TOPIC: ENVIR. PROT. & POLLUTION CNTRL
SUMMARY: Eliminates the need to have the Dept. of Environmental Regulation publish notice of Jurisdictional Declaration Statements in the Florida Admin. Weekly.
AGENCY CONTACT: Richard Cantrell, Environmental Administrator, Dept. of Environmental Regulation, Bureau of Wetland Resource Management, Rm. 524, 2000 Blair Stone Rd., Tallahassee, FL 32399-2400, (904)486-0123
CITATION: FAC 17.312.040; Dredge & Fill Activities EFFECTIVE DATE: 7/2/92
COMMENT DEADLINE: 7/23/92
HEARING DATE: 8/4/92

IL 4955
AGENCY: Dept. of Mines & Minerals
TOPIC: RES. MGMT & PRESERVATION
SUMMARY: Contains general procedural rules applicable to administrative hearings.
AGENCY CONTACT: Karen Jacobs, Legal Counsel, Dept. of Mines & Minerals, 300 W. Jefferson, Ste. 300, P.O. Box 101387, Springfield, IL 62791-0137
CITATION: 62 IAC 1848.1 to 1848.9, 1848.11, .12, .13, .15, .16, .18, .20, .21, .22
PROPOSAL DATE: 7/10/92
COMMENT DEADLINE: 8/28/92

IL 4969 & IL 4971
AGENCY: Dept. of Mines & Minerals
TOPIC: RES. MGMT & PRESERVATION
SUMMARY: Sets forth hydrologic information requirements; enables the Dept. of Mines & Minerals to require additional information necessary to implement ground water quality regulations; sets forth requirements for the relocation of use of public roads.
AGENCY CONTACT: Karen Jacobs, Legal Counsel, Dept. of Mines & Minerals, 300 W. Jefferson, Ste. 300, P.O. Box 101387, Springfield, IL 62791-0137
CITATION: 62 IAC 1780.21, .33, .38, 62 IAC 1784.14, .16, .27
PROPOSAL DATE: 7/10/92
COMMENT DEADLINE: 8/28/92

IN 2364
AGENCY: Board of Reg. for Prof. Engineers
TOPIC: BUSINESS & CORPORATIONS
SUMMARY: Relates to professional engineers.
AGENCY CONTACT: Indiana Govt. Center-North, 100N. Senate Ave., Rm. 1021, & the Legislative Services Agency, 106 State House, Indianapolis, IN 46202
CITATION: 864 IAC 1.1-1.1 thru 1.1-12-1
PROPOSAL DATE: 7/10/92
COMMENT DEADLINE: 7/24/92
HEARING DATE: 7/24/92

MI 1921
AGENCY: Dept. of Pub. Health, Div. of Water Supply
TOPIC: ENERGY
SUMMARY: Comprises the well construction code & establishes criteria for the registration of well drilling contractors, pump installers, well drilling machines & service vehicles.
AGENCY CONTACT: Division of Water Supply, Dept. of Public Health, P.O. Box 30155, Lansing, MI 48909, (517)335-8790
CITATION: R 325.1601 thru .1608 & .1610, .1611, .1612, .1613, .1621 to .1722 (non-sequential)
EFFECTIVE DATE: 6/30/92
COMMENT DEADLINE: 7/30/92
HEARING DATE: 8/13/92

MT H 20 b
AUTHOR: Raney
TOPIC: ENVIR. PROT. & POLLUTION CNTRL
SUBTOPIC: ENVIRONMENTAL ISSUES - MISC.
SUMMARY: Requires state agencies to recover the full cost of an environmental review under the Montana Environmental Policy Act.
STATUS: 7/8/92 INTRODUCED.
Stone Association Wins Six-Year Battle; OSHA Rescinds Provisions to Regulate Non-Asbestiform Minerals as Asbestos

The National Stone Association won a six-year battle with the U.S. Department of Labor's Occupational Safety and Health Administration when OSHA amended a 1986 regulation to rescind provisions that would have treated non-asbestiform actinolite, tremolite, and anthophyllite (AT&A) minerals, commonly found in aggregates, as asbestos.

"Aggregate producers are pleased with OSHA's decision to remove AT&A minerals from regulation as asbestos," said NSA Senior Vice President Frederick A. Renninger, CPG-1738. "It is consistent with points established by our industry during the 1990 hearings to consider the matter. Our only regret is that it took six years for OSHA to arrive at a decision that it should have reached in the first instance!"*
TODAY IN WASHINGTON

F. B. "Ted" Mullin, CPG-1716

As we expected, the Senate has passed the Bumpers bill to update the 1872 Mining Law. The Senate's change would require the miners to pay fair market value for patent instead of the current rates of $2.50 and $5.00 per acre. Also, and more important as far as I am concerned, the patentee will not be able to convey the land to a developer or for a non-mining use without the approval of the Secretary of Interior. According to the 8-6-92 Wall Street Journal, Industry has accepted these changes.

The Executive Branch released new standards of ethical conduct for Federal workers on August 6th, but without answering whether or not Federal employees should belong to professional organizations. Ethics Office Director, Stephen Potts says that while some people believe that Federal employees belonging to professional organizations face conflicts of interest, his office believes it is extremely important for Federal employees to participate in professional organizations.

Perhaps if more Federal employees were active in AIPG, other members might learn more about how our government really works. It is surprising how little many geologists know about the workings of the "Fed".

More from the Senate side of the "funnyfarm". On July 30, Senator Max Baucus (D-MT) introduced S-3107, a bill to provide for the protection of vertebrate paleontological resources. A hearing has not been scheduled. The bill was prompted by the increasing debate over the status of fossil collecting on federal lands. Two major concerns that are the focus of the bill are how to deal with vandalism and the role of commercial collectors. The bill has several interesting provisions, and a handful of administrative burdens. In summary, the bill addresses only vertebrates; sets up cooperation between agencies, paleontologists, and the public; establishes that paleontological resources are managed separately from archaeological and cultural resources; establishes a permit process; declares that paleontological resources on federal lands will remain property of the U.S.; describes prohibited acts, penalties, and enforcement; exempts location information from FOIA; requires an inventory of federal lands; and establishes an annual report to Congress. This summation of the bill was provided by Tom King, U.S.F.S., Washington Office, Minerals and Geology Staff.

Vol. 57, No. 142, Page 32756 - Department of Interior, BLM - 43 CFR Part 3160 - Proposed Rule

Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; Onshore Oil and Gas Order Number 1, Approval of Operations.

This proposal provides requirements necessary for the approval of all proposed oil and gas exploration, development or service wells on Federal and Indian onshore oil and gas leases. It also covers most approvals necessary for subsequent well operations, including abandonment. This order will also be incorporated by the Forest Service into its oil and gas regulations.

Vol. 57, No. 142, Page 32743 - NRC, Petition for rulemaking; Notice of Receipt.

The New England Coalition on Nuclear Pollution filed a petition requesting NRC amend its regulations regarding waste classification of low-level rad waste to restrict the number and types of waste streams which can be disposed of in near-surface disposal facilities. Current technical requirements for waste classification are found in 10 CFR 61.55.

For further information contact Michael Lesar, Chief, Rules Review Section, Division of FOI and Public Services, U.S. NRC, Washington, DC 20555, Tel-Toll Free 800-368-5642.


Recreation and Public Purposes Act, Final Rule

This amends existing regulations to provide special procedures for conveyances of public lands for solid waste disposal or related purposes. The Act authorizes permanent conveyances without the standard reverter provision where the lands are to be used for the disposal of a hazardous substance. My interpretation of this is... if you want it, you got it all.

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The Federal Communications Commission could use a little help in their communications efforts, judging from the title of the following meeting notice: "Below 1 GHz Negotiated Rulemaking Advisory Committee".

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Tilting The Skew

William V. Knight, CPG-0153

A couple of months ago I passed on some ideas about developing job opportunities which were advanced by an engineer friend of mine. At the time, I mentioned that he had some other ideas that might bear some thought and discussion...even though I do not wholly agree with them.

One idea he had concerns the natural gas industry. As many of us know, the exploration and production segments of that industry are pretty severely depressed right now. There has been a lot said and written about using natural gas in place of gasoline in motor vehicles. There have been some scattered attempts to expand its use through fleet conversions, etc. However, there has not been any sort of strong, concerted, sustained nationwide effort. So far, everything has been pretty much on a local basis, involving only one or a few suppliers and consumers.

He wondered why the natural gas industry does not organize itself to (1) develop some relatively inexpensive conversion kits; (2) design engines that can switch readily between fuels; (3) design a storage system that extends the car's range, yet does not eliminate so much valuable cargo space; (4) provide a widespread network of refueling stations; and (5) commit to a nationwide sustained drive to convert the transportation industry from gasoline to natural gas. I am sure many of you have wondered some of the same things. There are a lot of difficult technological problems in the answers to some of these. But, "difficult" is not synonymous with "insurmountable".

Commenting on the assumption that this should significantly reduce the negative impact of imported oil on the nation's balance of payments; help to reduce air, water and soil pollution; increase employment in the natural gas exploration, production and delivery industry; etc., he suggested that government has a place in all of this. As with everything else in our lives, government's power is in the realm of taxation and regulation. These are always skewed in some direction or another. In reality, as long as there is one tax or one regulation, there is no such thing as a "level playing field". The issue is, which way it will be tilted. He seemed to favor some sort of subsidy system, in addition to favorable tax and regulatory treatment. He recalled the rural electrification program of the 30's, 40's and 50's that electrified the countryside. He also recalled the development of the TVA and other large electrical generating projects.

Then, he got into the cost of all this. It will not be cheap. If the government is going to give tax and regulatory incentives, they will have to be paid for. How is this to be done? Aside from the balance of payments, what factors are there? He mentioned the cost of maintaining a military to protect our foreign sources of oil and the transportation corridors to get it here. He pointed out the jobs that would be brought home by developing and producing domestic, instead of foreign, energy supplies. He wondered about the cost of maintaining the strategic petroleum reserves and opined that they would no longer be needed. He speculated on both the economic and the health costs of using gasoline versus natural gas and the benefits of reducing air, water and soil pollution through the widespread use of the much cleaner fuel. How can a price be put on these? How can elimination, or reduction, of these and other costs be used to pay for the cost of replacing gasoline with natural gas? How can the industry do all of these things without running afoul of anti-trust laws? These all are questions that result from government, and only government has the authority, if not the will, to answer them.

How does AIPG fit into all of this? Among other things, AIPG is supposed to be the political arm of the profession. We are supposed to lead the profession in the state and national capitol. We are supposed to be the political activists among geologists. We are supposed to make our will known and to offer answers to the questions and issues we raise. We are supposed to wake up a somnolent profession and stir it to action before it dies. We are few but, as our Colorado Section has recently shown, through organization and determination we can multiply our strength and our political power. We only have to want to badly enough.

Do we want to reduce oil imports and pollution and bring jobs home? Do we want to expand employment opportunities for geologists in exploration, development and transportation of natural gas? Do we want to badly enough? Are we really serious?*

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Executive Director's Itinerary
(subject to change)

The Executive Director is visiting various Sections, agencies, campuses, and other organizations. He is talking, listening, and exchanging information and ideas. Members are encouraged to attend these meetings wherever and whenever possible. His itinerary for the next several months, as presently scheduled, is:

Sep. 27-30: AIPG Annual Meeting, Lake Tahoe, NV
Oct. 5: Geoenvironmental Forum, Long Beach, CA
Oct. 17: American Institute of Hydrology, Portland, OR
Oct. 20: Colorado Section, Denver, CO
Oct. 21-23: Ohio Section and campuses, Cincinnati, Dayton, and Columbus, OH
Oct. 24-28: Geological Society of America, Cincinnati, OH
Nov. 13-14: Association of State Boards of Geology, Portland, OR
Dec. 9-10: Louisiana Section and campuses, Baton Rouge and Lafayette, LA
Jan. 23: AIPG Executive Committee, Arvada, CO
Interview Questions

Introduction

An interview is the culmination of many of the efforts involved in a job search.

National averages indicate there is about a 30% chance you will be offered a position if you get a first interview. If you are invited for a second interview this probability increases to about 70%.

Both percentages can be significantly increased by careful preparation.

General Suggestions

Here are a few steps that will assist in your preparation:

1) Do research to develop information on the organization of interest by visiting a large public library and asking a research librarian for help. Obtain financial and operational information and names of people. This information will help convey preparation and sincerity of interest and will assist in your assessment of the organization.

2) Anticipate questions that will be asked. Several such questions are discussed below.

3) Practice answers to questions out loud. Watch yourself in a mirror while practicing the answers.

4) Target your answers to the organization of interest by varying content and emphasis.

5) Always be positive but truthful. You need to be your own best advocate. Be assertive, confident and factual but not brash.

6) Be prepared for followup questions which the interviewer will ask to determine if you can express your thoughts in depth.

7) Assess, adjust to, and mirror the style of the interviewer. If he/she seems hurried, give quick, concise, action-oriented answers. If he/she seems formal, concise and detail oriented, try to talk in a linear and logical manner; make your point then back it up with specific details. If he/she seems to like ideas, talk in terms of broad concepts. If he/she seems relaxed, be friendly and willing to spend more time on general topics; however, without usurping control of the interview, be sure to spend a sufficient amount of time talking about your qualifications.

8) "Psych-up" and "calm-down" by visualizing yourself as articulate and poised in the interview. In your mind, capture a situation in which you feel very comfortable. Project this feeling into the interview. Immediately before the interview, take a couple of deep breaths and relax.

9) When meeting the interviewer, shake hands with a firm grip and make solid eye contact.

Interview/Questions

There are two basic types of interview questions: 1) General and 2) Detailed inquiries about your qualifications or experience.

Here are some general questions that are frequently asked:

1) Tell me about yourself? Prepare an answer that will take approximately two minutes. Start by telling where you grew-up, where you went to university and what degrees were obtained. Then mention several of your qualifications, experiences, and accomplishments that are relevant to the job you are seeking. If you have time, mention a couple of conclusions from your research for dissertation, thesis, or other projects.

2) Why did you decide to become a geologist? Think through what you like about geology. Then, list these reasons to answer the question. For example: "My older brother was a geologist and regularly took me rock and mineral collecting. "We would talk about geologic structures and history." From an early age, I always wanted to know how the earth came to be the way it is." "Later, this translated into an interest in learning geologic tools to help describe and understand depositional environments." "Today, I want to utilize the knowledge I have to improve the world's environments."

3) What are your strengths? List three. Include both personal and professional strengths. For example: "I am very capable of handling large volumes of data." "I have a very strong background in geochemistry." "I am a very hard worker." Then give appropriate examples of these strengths.

4) What are your weaknesses? Give one and be prepared to discuss a second if the interviewer asks. Choose an actual "non-fatal" weakness and/or one that might be a strength. Some obvious examples of fatal weaknesses for a geologist would be: "I grow impatient when I have to work with too much data." Or "I am not comfortable looking at the big picture." A better weakness for most situations would be: "I grow impatient when meetings are too long." A skilled interviewer may then followup by asking about a situation in which the weakness caused a problem and/or what you have done to correct it.

5) What are your goals? Think about and be able to articulate both short term and long term goals. Be sure your answer is tuned to include the situation for which you are being interviewed. A recent graduate might answer: "I would like to grow and develop professionally as a geologist." "I have learned a lot but I'm very eager to gain additional experience." "I am also interested in management after a few years' experience."

6) Experienced candidates may be asked reasons for leaving a previous job. If you were laid-off, state that your termination was a part of a mass layoff then point out how you have seized the opportunity to develop or position yourself better in your career. If you left voluntarily,
answer that you left for professional advancement. Do not say anything strongly negative about a previous employer.

7) Experienced candidates may also be asked about salary history. Be sure you have researched pay ranges for the new situation through publications or networking. If your salary history doesn’t fit the new situation, have a plausible reason why the new salary and position are appropriate for you.

Many other general questions could be asked. Complete your preparation for these questions by reading a book on job searches such as: Medley, A.H., 1984. "Sweaty Palms." Ten Speed Press, Berkeley, CA.

After completion of general questions, the interviewer will ask about your professional qualifications. Most of these questions will be from content of your resume. Thus, you should be prepared to discuss in more detail and/or provide examples for these items.

Recent graduates may be asked about grade point average. If you G.P.A. is good, answer factually. If your G.P.A. is fair or poor, answer factually then point out patterns of improvement and segments of strength such as your major.

Be prepared to discuss strong points of your coursework. Be prepared to answer questions on your thesis or dissertation. Then, discuss in more detail if interest is shown by the interviewer.

Experienced candidates should be prepared to discuss all aspects of work history and experience.

Questions For You to Ask

Toward the end of the interview, the interviewer will give you a chance to ask questions. Ask about the job or organization. Do not ask about pay, benefits or hours until after you have a job offer. A particularly good question is: "What would you like me to accomplish in the first 6 months on the job?" This part of the interview is also a good opportunity to ask questions that make it obvious you have done research on the organization.

Conclusion of the Interview

The interview will be closed by a statement such as: "Thanks for coming in." "You have some good qualifications but we still have several other people to interview." Since you are marketing your skills, you need to reply with closing statements such as: "I appreciate your time and I am really interested in your organization." "I am particularly impressed with..." "I believe I would fit in very well because:...[give three reasons you would be good at the job]." Then, conclude by asking; "May I telephone in a few days to see if you need any more information?"

Followup

Immediately after the interview, follow up with a thank-you note in which you A) Express appreciation, B) Indicate interest in the job, C) List your most important qualifications, and D) Discuss any important items not covered in the interview.

After a few days, follow up with a telephone call in which you ask if you may supply any additional information.

When You Get A Job Offer

When you receive an offer, be sure to ask questions to clarify all aspects of compensation, benefits, and job description. Ask for the offer in writing. If you cannot get the offer in writing, be sure to summarize all salient points of the offer in a formal letter of acceptance if you wish to take the position.

You may wish to negotiate some aspects of the job offer. Negotiation should be undertaken very carefully because you could lose the job offer. We will discuss negotiation in a subsequent column.

Tom Warren, CPG-7833, lives in Golden, Colorado and works as a career and outplacement consultant.
ARTICLE REACTION

Quantity or Quality?

John A. Franklin, CPG-3662

"The great era of qualitative descriptive geology is past" (The Professional Geologist, Volume 29, Number 8, July 1992). I must respectfully beg to differ with my dear friend, colleague and coauthor Maurice Dusseault, on this statement.

Geological engineering is now, and I believe will quite rightly remain, more of a craft than an art of a science. Craftsmanship depends on a thorough "feel" for the materials (in our case, rock, soil and ground water), and a dexterity in manipulating the tools of the trade (in our case the methods of site investigation and testing, modeling, computation and design, excavation and stabilization, instrumentation and monitoring).

Would you think badly of your doctor for not using finite element analysis to cure your disease? Of course not. Geological engineering is much the same, but now the "patient" is the ground. You need to give an accurate and if possible, inexpensive diagnosis and prescription.

Perhaps the most important skill of the "geocraftsman" is an ability to view a project as a whole, and to temper rigorous scientific method with common sense. Empirical design, "quantified judgement based on experience", is by far the most prevalent form of design even though some engineers and professors don't care to admit this. The number of projects that can really benefit from analytical modeling are perhaps one in a hundred. It may seem like more, because these are the glamorous high-profile projects worthy of hiring a professor, and publishing in a learned journal.

In describing the rock engineering at the Lagrange hydroelectric complex in Quebec, Murphy and Levay (1985) remarked that "experienced judgement based on field observations is usually more valid in the assessment of rock treatment requirements than any strictly theoretical approach". They made good use of mathematical models to dimension the rock pillars and caverns and to investigate rock stresses and seepage gradients around penstocks, but the studies were always viewed as of "qualitative rather than quantitative significance."

In the recently published (1992) Guide to Cavern Engineering published by the Geotechnical Control Office of Hong Kong, the consulting engineers at Berdal Stromme point out that although large caverns are "often analyzed to determine stresses and stability", the results are used "mainly to extrapolate experience to cover conditions not previously encountered". An empirical approach governs the design even of these large and expensive rock caverns. They stress that "mathematical analysis is no substitute for experience".

Disasters seem hardly ever to be caused by lack of precision or miscalculation, but much more often by neglect, ignorance, or overspecialization. Mother Nature likes to take a kick at those who turn their backs on her.

What then is the malaise that grips our profession, if there really is one? "Melbourne Age" reports that Australia's graduates are facing their worst employment prospects in nearly 20 years. "Mining World" (USA) reports that the "university pipeline of mining graduates has been reduced to the merest trickle": 133 graduated in 1990 compared with 793 in 1981. Canada has expressed concern that "availability and quality of (mining engineers) could seriously limit the ability of Canadian industry to compete globally."

Are we in universities doing enough, not only for our graduates but for our image? A Canadian survey of attitudes among government officials reports that "universities have not kept up with changing societal demands...the words most frequently used to describe them were "remote", "isolated", "elitist", "arrogant" and, perhaps most kindly, simply "naive". "In recent years, the linkage between university education and employability has become tenuous...leading governments and the public to question whether taxpayers are getting their money's worth..."

The "publish or perish" policy is partly to blame, and forces an increasing preoccupation with research. As a result, an unacceptable number of professors are preparing students either for careers of yesterday for which there is a little or no demand, or for no careers at all.

Employment prospects for graduates with qualifications in rock science and engineering are being reviewed by the International Society for Rock Mechanics Commission on Education, through a working group led by Dr. Eileen Ashworth of the South Dakota School of Mines and Technology. The study addresses the spectrum of available careers and how this is changing; the corresponding trends in demands for graduates; and the changing skills and qualifications required for each type of job.

It is indeed difficult to know precisely the demands of rapidly growing industries such as environmental engineering, and the rate at which traditional industries such as mining are becoming mechanized and less labor-intensive. The num-
bers of jobs are changing, and so are the educational requirements.

The ISRM Commission on Education is also preparing a "Curriculum Guide" to help teachers plan or update their courses. Employers these days demand that graduates reach them equipped with an increasingly broad range of information and skills. It is hard to accommodate everything in a balanced curriculum and to decide what to include and what to omit, and how much time to devote to each topic. The teacher has an important responsibility to frequently review course content, and to provide students with a practical and up-to-date training that will equip them for careers into the twenty-first century. Comments and suggestions would be most welcome as a contribution to either the job market review or the curriculum guide.

In conclusion, although I agree with much of what Professor Maurice Duseault has to say in his article, I believe we should place the emphasis on achieving a balance between traditional geological and engineering skills, neither of which can be neglected. Geological engineering is a decision-making process which can benefit from quantification through such techniques as "expert systems" perhaps more than from the more traditional analytical approaches. Above all, a thorough understanding of geology and of the character and behavior of earth materials remains our most important asset.

References

Footnote
1. John Franklin teaches geological engineering part-time in the Department of Earth Sciences at the University of Waterloo, Ontario, Canada N2L 3G1 and is President of the Commission on Education of the International Society for Rock Mechanics.^

CONGRATULATIONS!

The American Institute of Professional Geologists Announces 1992 Award Recipients

The American Institute of Professional Geologists is pleased to announce that the following individuals have been named 1992 honors and awards recipients:

**BEN H. PARKER MEMORIAL MEDAL**
Robert H. Dott, Jr.

**MARTIN VAN COUVERING MEMORIAL AWARD**
Kenneth N. Weaver, CPG-1064

**PUBLIC SERVICE AWARD**
Robert R. Jordan, CPG-1262

**AWARD OF HONORARY MEMBERSHIP**
Sam R. Evans, CPG-3349
Richard J. Proctor, CPG-5091

**PRESIDENTIAL CERTIFICATES OF MERIT**
Lawrence C. Weber, CPG-7120
Russell G. Slayback, CPG-2305
Don E. Williams, CPG-1340
Logan T. MacMillan, CPG-4560

Awards will be given to recipients at the AIPG Annual Meeting in Lake Tahoe, Nevada. The Awards Luncheon will be held on September 28th, 1992.
Letter To The Editor

Fred L. Fox, CPG-1273

TPG Editor:
We will never resolve the geologist/engineer dilemma until we find a common and stable starting place. I refer to the recent spate of Geologist/Engineer articles that will continue in the August issue of TPG.

Chris Mathewson immediately gets on the wrong track by classifying geologists as scientists and engineers as applied scientists (TPG, July 1992, page 5). I don’t believe that engineers are "educated scientists" of any kind. And being a geologist in no way prevents me or most of my peers from applying our science directly to societal needs. For most of my 35+ years in the profession I’ve done mostly application of my chosen science. It’s been impossible to keep current with the science end of the equation. I’ll guess that most geologists in the consulting business apply their science rather than pursue pure science. And certainly Engineering Geology is not a science. Engineering anything can’t be a science, simply by definition.

Dr. Mathewson wrongly states that society "demands" that the geologist provide multiple working hypotheses. Society really has no clue regarding the method (of multiple working hypotheses) and, unfortunately, neither do most engineers. Multiple working hypotheses is the real stuff of geologic thought, the approach that makes geologists (philosophically) different from engineers, and the difference that probably precipitates the real conflict between geologist and engineer. Geologists and engineers do indeed think differently (in spite of Mr. Rothschild’s statement to the contrary in his own otherwise perceptive article, TPG, July 1992, page 18).

Nor is the difference between engineer and geologist defined at the soil/rock interface, as suggested by Mr. Peak (TPG, July 1992, page 8) (soil being nothing but worn-out rock, and the older anything is, the more claim geologists can lay to it). Further, the Precambrian thinking that geology is qualitative while engineering is quantitative can be quickly laid to rest by a visit to a modeling or geostatistics classroom. The problem is that the geologist knows that there is more than one possible answer and often must take a discriminating (and possibly subjective) approach (anathema to the engineer) when applying technology to culture/society. The point is that the engineer wants absolutes, quantification of that which cannot be accurately quantified, and is impatient with the geologist who cannot (or will not) do so.

In closing, Dr. Mathewson (hopefully unwittingly) places the entire burden on geologists, stating that engineering errors are based on wrong/incomplete geologic information and thereby implying that the engineer’s only mistakes can be laid to the geologist. Jeff Keaton doesn’t make this error (see his article; TPG, July 1992, page 12), perceiving that many engineers tend to disregard "the geologic issues of complexities, randomness and change," but shows his true (PE) colors by suggesting that geologists "assist engineers in making geology-based decisions." Engineers have no business making "geology-based decisions," which probably is an underlying reason why some geologists want (and most engineers do not want) registration of geologists.

The relationship between geologist and engineer is a complex one made worse by unequal treatment under the law and compounded by the legal aberration of the otherwise ethical term "professional." Playing with words and/or terminology will not get the job done, nor will hiding our heads in the sand. We have to recognize the problem for what it is—a power struggle with geologists on the short end of the stick—and that the other side isn’t going to relinquish power until society (not us) sees that it’s detrimental to the public welfare and forces the issue.

The problem is that the stick has two ends, and the end may be in sight for geologists. In New York there is a powerful movement to register "environmental professionals," and the description of what these professionals may do includes environmental geology. Guess who is not included (geologists), and guess who is (engineers)! Who do you suppose might be in back of this one! If this flies, nearly everyone else but geologists will be empowered to practice environmental geology in NY, removing us from the applied loop and stuffing us back into the museum of the 1950s. Hang in there, Chris, we may be relegated to science yet.

There’s an answer, you know, but we have to be willing to start from the right place. Until we agree on that, we’ll continue to disagree on much that follows.

NEXT ISSUE

THEME: Geoscience Education, Continuing Education And Careers - Part 2
- The Professional Geologist Meets The Pre-College Classroom
- Geoscience Education And The Professional Geologist: The Need For Greater Cooperation
- The Future Of Geoenvironmental Logging
- Undergraduate Geology Curricula - What We Expect, What Graduate Schools Expect, and What Exists.
October 5-7, 1992. Risk Assessment/Management Issues in the Environmental Planning of Mines Conference, St. Louis, MO. Contact: Meetings Dept., SME, P.O. Box 625002, Littleton, CO 80162, Ph.: (303) 973-9550, Fax: (303) 979-3441.


October 13-15, 1992. FOCUS Conference on Eastern Regional Ground Water Issues, Newton, MA. Contact: NGWA, P.O. Box 182039, Dept. #017, Columbus, OH 43218-2039, Ph.: (614) 761-1711.

October 16-22, 1992. Interdisciplinary Approaches in Hydrology and Hydrogeology, Portland, OR. Contact: Helen Klose, AIC, 3416 University Ave., S.E., Minneapolis, MN 55414, Ph.: (612) 379-1030.

October 18-21, 1992. RMAG Horizontal Drilling Symposium, Denver, CO. Contact: Rocky Mountain Association of Geologists, 730 - 17th St., Ste. 350, Denver, CO 80202-3508, Ph.: (303) 573-8621.

October 26-28, 1992. International Conference on Extractive Metallurgy of Gold and Base Metals, Kalgoorlie, WA, Australia. Call for papers. Contact: Dr. V. N. Misra, Conference Chairman, Kalgoorlie Metallurgical Laboratory, P.O. Box 881, Kalgoorlie, WA 6430, Australia, Ph.: (090) 220 120, Fax: (090) 912 762.


November 4-6, 1992. Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Restoration, Houston, TX. Contact: NGWA, P.O. Box 182039, Dept. #017, Columbus, OH 43218-2039, Ph.: 614) 761-1711.


November 30 - December 4, 1992. Annual Fall Meeting of the Materials Research Society, Boston, MA. Call for papers. Contact: Materials Research Society, Meetings Dept., 9800 McKnight Road, Pittsburgh, PA 15237, Ph.: (412) 867-3003, Fax: (412) 867-3473. Abstract deadline: July 1, 1992.


1993


February 15-18, 1993. Society for Mining, Metallurgy, and Exploration, Reno, Nevada. Contact: Meetings Dept., SME, P.O. Box 625002, Littleton, CO 80162, Ph.: (303) 973-3461.


March 14-17, 1993. AAPG/SVO International Congress and Exhibition, Caracas, Venezuela. AAPG Convention Dept., P.O. Box 979, Tulsa, OK 74101-0979.


March 30 - April 4, 1993. AusIMM Annual Conference celebrates the Centenary of The Institute, Adelaide, South Australia. Call for papers. Contact: R. K. Johns, C/-Department of Mines and Energy, 191 Greenhill Road, Parkside, South Australia 5063, Ph.: (08) 274-7500, Fax: (08) 272-7597. Abstract deadline: May 1, 1992.

April 17 - 20, 1993. SECG Conference '93, Integrated Methods in Exploration and Discovery, Denver, CO. Call for papers and posters. Contact: SECG Conference '93, P.O. Box 571, Golden, CO 80402, USA, J. Alan Coope, Ph.: (303) 992-6534 or (303) 791-7291 or Richard L. Nielsen, Fax: (303) 279-3118.


May 5-8, 1993. Protecting the Earth: Challenges to Science and Technology, Congress Center East of Köln Messe. Contact: Köln Messe, Messe- und Ausstellungs-Ges.m.b.H. Köln, Messeplatz 1, Postfach 21 07 60, W-5000 Köln 21, Ph.: +492 21/821-0, Fax: +492 21/821-2574.

May 15-21, 1993. AIA Second USA/CIS Joint Conference on Environmental Hydrology and Hydrogeology, Arlington, VA. Contact: Helen Klose, AIF, 3416 University Ave. S.E., Minneapolis, MN 55414-3328, Ph.: (612) 379-1030.


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May 17-21, 1993. International Coalbed Methane Symposium, Birmingham, AL. Contact: Dan A. Thompson, The University of Alabama, College of Continuing Studies, Box 870388, Tuscaloosa, AL 35487-0388, Ph.: (205) 348-8222.


June 24-25, 1993. ASTM Symposium on Analysis of Soils Contaminated with Petroleum Constituents, Atlanta, GA. Contact: Symposium Chairman Tracey O'Shay, Gordon and Lawton, P.O. Box 80072, Austin, TX 78727-0072, Ph.: (512) 475-2302. Abstract deadline: June 23, 1992.


1994

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MEMBERS IN THE NEWS

David E. Fulton, CPG-8187, of Handex Environmental Recovery, has relocated to the company's Eastern Pennsylvania (Oaks) office. As Senior Project Manager, David will provide technical oversight and management services on all petroleum hydrocarbon contamination projects from initial detection and delineation through final remediation.

Charles W. Welby, CPG-1033, of North Carolina State University was appointed to the post of 1992 Chairman of the Engineering Geology Division of the Geological Society of America late last year and organized and co-chaired a symposium at the Annual Meeting of GSA in San Diego, California, in the fall of 1991 on Geo-Risk Assessment.

Ivan L. Gilmore, CPG-6039, was promoted on November 12, 1991 to Chief Geologist at Texasgulf's Phosphate Mining Operations near Aurora, North Carolina. Ivan has been with Texasgulf's Long Range Planning Department since 1982 and has been serving as Superintendent of Mine Planning since October 1988.

Christopher J. Kopley, CPG-7678, has accepted the position of New York/Metro Regional Manager for Environmental Science Services of Providence, Rhode Island, and has opened a new office in Westport, Connecticut.

Haig F. Kasabach, CPG-1461, New Jersey State Geologist, has been appointed to the Intergovernmental Task Force on Monitoring Water Quality to review and evaluate water-quality-monitoring activities throughout the U.S. and report to OMB, Congress, Federal agencies, and the States with recommendaotins for needed improvements.

CORRECTION

In the August Issue of The Professional Geologist an article by Richard E. Blubaugh entitled "1872 Mining Law: Time for Clarification and Affirmation" was printed without credit to the Geotimes Magazine in which it was originally published in April, 1992.

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APPLICATIONS RECEIVED - (July 29, 1992 - August 29, 1992)

Applicants for certification must meet AIP's standards as set forth in its Bylaws on education, experience, competence, and personal integrity. If any Member has any factual information as to whether that information might be positive or negative, please mail that information to Headquarters within thirty (30) days. This information will be circulated only so far as necessary to process and make decisions on the applications.

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