AIPG 42nd ANNUAL MEETING

“GEOLOGIC INFORMATION: RACING INTO THE DIGITAL AGE”

Lexington, Kentucky
October 9 – 14, 2005

Hosted by the Kentucky Section of AIPG

The Kentucky Section of AIPG invites you to the 42nd Annual AIPG Meeting to be held October 9-14, 2005 in Lexington, Kentucky. The 2005 Annual AIPG Meeting will be held at the Radisson Plaza Hotel in downtown Lexington, Kentucky.

Kentucky is known for its friendly people and southern hospitality. Located in the heart of the Bluegrass Region, Lexington is also recognized as the horse capital of the world. Fall is an ideal time to tour the many horse farms lined with acres of picturesque stone and wood plank fences. It is also a great time to visit Keeneland Race Track, renowned for its beauty and excitement. The 2005 AIPG meeting will occur during Keeneland’s Fall Meet.

The theme of this year’s conference “Geologic Information: Racing into the Digital Age” was chosen because of the technological challenges faced by today’s geologists. A thorough knowledge of Geographic Information Systems, database tools, software solutions, and Web-based information dissemination is a necessity in many cases. The goal of this meeting is to assist you in meeting these needs in the technical world.

Please make plans to attend the 2005 National Meeting in Lexington. Consider becoming a Speaker, an Exhibitor, or Sponsor at the 2005 meeting.

For information, contact
Tom Spalding
General Chairman
(502) 458-1209
AIPG2005@yahoo.com

Or go to our Website at www.professionalgeologist.org
THE PROFESSIONAL GEOLOGIST

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FRONT COVER — Portion of Big Hill Road Cut on KY. 421 in Madison County showing Mississippian age Borden and Slade Formations. Photo by Randy Paylor, Kentucky Geological Survey.

American Institute of Professional Geologists (AIPG) is the only national organization that certifies the competence and ethical conduct of geological scientists in all branches of the science. It adheres to the principles of professional responsibility and public service, and is the umbilical cord for the geological profession. It was founded in 1963 to promote the profession of geology and to provide certification for geologists to establish a standard of excellence for the profession. Since then, more than 10,000 individuals have demonstrated their commitment to the highest levels of competence and ethical conduct and been certified by AIPG.

The mission of the American Institute of Professional Geologists (AIPG) is to be the superior advocate for geology and geologists, to promote high standards of ethical conduct, and to support geologists in their continuing professional development.
EDITOR'S CORNER

I wish to all of our members and staff a Happy and Safe New Year!

I asked myself this time last year what would TPG contain and look like? I did not know the answers, but was willing to invest as much time as I could to ensure that the mission of TPG carried on into 2004. Many Editors preceded me and all kept TPG strong and the voice of the members! I am not here to perform a self-evaluation, but rather to acknowledge the support and contributions of all of our members and the staff at National Headquarters. I most want to applaud all of our efforts at attracting student members and student contributions to TPG. We must provide opportunities for student, as well as, all members to enjoy the contents of TPG.

To this end, we have been gearing up for this issue of TPG for the last several months. Our principal goal was for members to submit articles that would help our student members and potential student members better understand and prepare for our profession as they move into the work force. As you will read below, the response was phenomenal! TPG received e-mail responses and letters from a few dozen members. Most of these articles reflect upon each member's own geological experiences - the good times and the not so good. All of these experiences and pathways serve as valuable information and guidance for the next generation of geologists. Thank you for all who contributed!

Let me know your thoughts on this type of format for future TPG issues.

The Annual Meeting in Saratoga Springs was fantastic! Hats off to all NE-AIPG members and National Headquarters for putting on a very successful meeting. Check out the summary article by Bob Stewart and the photographs. Ah yes, Mother Nature cooperated with great weather. We are looking forward to Kentucky in just a few short months.

In closing, a special thank you to all of the contributors and advertisers to TPG. A thank you also goes out to all of the Associate Editors of TPG. A special thanks to Dave Niemeyer at Geosphere for donating his time to TPG. 2004 was a very good year for TPG.

QUESTIONS OF THE MONTH

The following questions are offered to stimulate some discussion and get feedback on personal experience and research efforts. The questions do not reflect the position of AIPG or the Editor. Send your response and suggestions for future questions to wjd@aipg.org.

1. What type of course or courses would be most valuable to you for earning continuing education credits?
2. Can the geological sciences be used to help find the lost city of Atlantis?

Responses to Questions from TPG Nov./Dec. 2004

1. As a member of AIPG, what events would attract you to attend/participate in the Annual Meeting?

As a member of the Oregon State Board of Geologist Examiners, I already must spend time away from the workplace to attend various board and ASBOG functions. My firm compensates me for only a minimum of missed work time, so I must use my hard-earned vacation time to make up the rest. This poses a burden on my allotted vacation time rather spent with my family. Further, my company would not support my participation within AIPG, beyond annual membership renewal, as AIPG is viewed as a clearing-house organization that is used by states, which not only lack registration of geologists, but also where professional services rendered by a CPG are relegated to voluntary status. Therefore, at this time, I cannot justify additional participation in professional geology functions, such as the AIPG annual meeting.

2. What attracted you to the Geological Sciences as a profession?

I credit three things that led me to the field of geology:

1. My 9th grade science teacher;
2. My 12th grade Earth-Space Science teacher; and
3. No other field excites me the way geology does.

When I was in the 9th grade at Bancroft Junior High School (San Leandro, CA), I had a great general science teacher (Kenneth Dawdy), who not only knew geology but also knew how to teach it. This unusual combination for a public school junior high school teacher made him a great mentor to many students. I participated in his Outdoor Club's student pack-packing trips, white-water rafting trips, and caving expeditions in the Sierra Nevada Mountains and on the Northern California Coast. While floating down a river, he would point out and explain geological features, describe processes that created them, and do so on both macro and micro scales. I was smitten. I couldn't wait until my senior year of high school to take the only geology class offered in our high school. There, my passion for geology was further nurtured by Mr. Jensen in his Earth-Space Science class at San Leandro High School (San Leandro, CA). Mr. Jensen would practically lose his breath because of his excitement and passion for teaching geology. In my teenage years, my family teased me incessantly, because so many of my verbal deliveries began with, "Mr. Jensen says......".

I suspect that I would have been drawn to the field eventually, and I truly believe it is innate, in my blood. I understand that I was unusually lucky enough to have been smitten at such an early age, but I do give Mr. Dawdy and Mr. Jensen such great credit for my choice in careers. It wasn't a choice for me but an innate fate.

Eileen Webb, RG, LG, CPG-10803

Responses continue on page 14
Dear Editor:

I am always impressed with the high quality of the summer interns AIPG helps support in partnership with AGI, and I enjoy reading the reports of their Capital Hill experiences in The Professional Geologist. I have a couple of comments on Bridget Martin's balanced and informative article on refinery capacity in the U. S. that appeared in the November/December TPG. Ms. Martin notes that no new refineries have been built in the U. S. since 1976, but fails to mention that U. S. oil production peaked in 1970. In fact, due to convergence of a number of factors including Hurricane Ivan's march through the Gulf of Mexico and several refineries undergoing major maintenance, September 2004 marked the lowest monthly refinery output in the U.S. since April 1950, over a half century ago!

Certainly there is a need to maintain and upgrade our existing refineries to make them more efficient and cleaner, but does it really make economic sense to put money into new refineries in the U. S. when the future of petroleum supplies in the world now clearly lies on foreign soil? Industry lobbyists may say that regulations and permits cause investors to put their money elsewhere and this is why no new refineries have been built in 30 years, but they are just blowing steam. If the petroleum were there, new refineries would get built. Even the additional supply generated by opening the Arctic National Wildlife Refuge (ANWR) to future production would not support the addition of more refinery capacity in the U.S., because the supply of oil there simply is not large enough to justify it.

The future of refinery capacity in the U. S. will likely be debated and decided locally, as Ms. Martin notes in the case of Shell Oil's Bakersfield operation. Shell (who should know) attributed the proposed closure to low oil supplies from the Kern River oil field. Consumer groups argue that this was a ploy by Shell to decrease supply and drive up prices. And so the debate continues, but the fact remains that U. S. oil production peaked nearly 35 years ago and the law of supply and demand is firmly in control as it always is and will be.

As the focus of how our limited natural resource base can and should be used to meet the country's energy needs grows ever sharper, geologists will continue to be at the center of the discussion. It is reassuring to know that the AIPG-AGI summer intern partnership is preparing well-informed young people to articulate the issues and tackle the needs of the future.

Tom Clark, CPG-06667

Dear President-Elect:

I most whole heartily agree with the requirements of an examination for candidates requesting membership as a certificated CPG. Tom Fallis article which appeared in the November/December 2004 issue of the Professional Geologist was well written and informative. He brought to the forefront the issue of being considered a qualified profession. Other professional organizations require testing of their members. It is paramount the AIPG requires the same scrutiny of its members. If not, we are always going to be looked upon as an inept organization of ill-qualified professionals.

We are a professional organization and as such it is time we moved on to answer this question. Enough debate has taken place. In short, enough is enough! Whatever the cost in time and money, it is insignificant. Our professional integrity demands that we be viewed by our peers on an equal basis.

You as our President-Elect have a wonderful opportunity to make this requirement a reality. Please do not hinder the momentum in progress. A strong leader is now needed. In the future, the AIPG will be in your debt for having made this important issue become a requirement.

Forrest S J ones CPG-04001

Dear Editor:

I suggest there is not a clear and best answer to the question of exam requirement for CPG. In a sense I believe Bill Greenslade hints to that as well in his very informative and helpful letter to the editor. Given the information and thoughts Bill presented, his Letter to the Editor might have better served TPG readers if it had been incorporated in the body of TPG issue. More people would have seen it there I suspect.

The examination such as ASBOG is a rite of passage for legal acceptance in a profession where state laws and rules require registration by the professional participants. Other than passage of the exam for geologist registration, CPG as noted has much of the same recognition requirements. Will the passage of the exam add credibility to CPG status? Probably yes in testimony for example where states do not require registration. For those states where registration exists, of less direct value. What the examination does do, even where not required, is provide a force-fed form of recurrency training. That can be counted as a plus regardless of state registration requirements. I do differ with Bill in that government employees are less likely to be widely versed professionally. True for some, but a considerable amount of geology government related work does require a broad range of professional work requirements as well as opportunities by the very nature of the government job. Some private sector work requires the same broad range, others will find their work geographically and geologically confined and narrow. I do not think generalities can be made.

While the ASBOG examination as I understand now addresses ethics as best as an exam can, there is still that part of ethics which cannot be directly tested. As regularly addressed in TPG, this provides a hands on value and possibly offers a potential of use when or if a CPG recognition is contested or asked about. If AIPG continues that thrust of ethics, chastises those where complaints may exist, seeks out as best as possible potential ethic concerns relative to an applicant, perhaps that is a soft answer to a hard question concerning the rite of passage by examination. I have heard and read some lawyers have expressed it is the code of ethics that really matters when it comes right down to it in a dispute. Thus it is the quality of those who are members of the profession. Quality is difficult to measure. The costs as a possible measure by the addition of an examination, as Bill points out, are very easily measured. Given expenses these days to maintain professional currency, those costs must be carefully weighed. This is especially important in a profession with limited membership. Geologists are among the minority in numbers of the professions. We must be careful that the expense of membership does not become a deciding factor in our total membership numbers, thereby reducing our effectiveness. It already is pushing that expense envelope especially when other professional currency needs are added to the tab.

If this proceeds to a committee approach, certainly Bill's points merit attention. I would hope he becomes a member of such a committee.

J im Williams, CPG-00374
## Members in the News

**Gerald M. Friedman, CPG-01531**

Friedman Geosciences Conference 2005 is to be held in North America, the homeland of geology, from September 11-14, 2005 at the Northeastern Science Foundation in the beautiful setting of Troy, New York. The scientific community will meet for the first Friedman Geosciences Conference 2005 in honor of Distinguished Professor Gerald M. Friedman, CPG-01531, (founding editor and Honorary Lifetime Member of the History of Earth Sciences Society) to celebrate his retirement from a career in geology, education, and government services. This meeting will be devoted to questions concerning most recent developments in the geosciences disciplines; most importantly the interaction among colleagues. The conference will feature all aspects of geology, environmental sciences, and will combine theme-oriented and volunteer papers.

This special program will host more than 20 different topics. We are hoping for over 1000 participants with the help of the International Program Committee, chaired by Dr. Arona Diouf. In addition to this, there will be four field trips in the Adirondack/Catskill areas including: one to Thacher Park in the Helderbergs, a boat trip on the Hudson River, a visit to the sites of the founders of American geology, and one to Central Park in New York City, all led by volunteer board members. Contact: Dr. Arona Diouf at (917) 302-2339 or e-mail adioufnd@yahoo.com.

**Kevin D. Lund, CPG-10052**

Lund most recently worked at the state of Michigan in the Department of Environmental Quality as a senior geologist for the Remediation and Redevelopment Division. Lund managed groundwater and soil cleanup projects. He was a member of the Southeast District Quality Review Team responsible for remedial action plan reviews. He provided technical review for projects regulated under Public Act 451, water resources, soil erosion and sediment control, contaminated land cleanup, underground storage tanks and brownfield redevelopment. Lund was appointed by the Washtenaw County Board of Commissioners to the Grading/Soil Erosion and Sedimentation Control Appeals Board, with his commission expiring in 2006.

Lund earned a bachelor of geological engineering degree from Michigan Technological University. In addition, Lund has been an active member in the AIPG as the current Michigan chapter treasurer and committee member for the licensure of geologists in the state of Michigan. Lund is also a member of the National Groundwater Association and the National Society of Professional Engineers.

Insight Environmental Services, Inc. is located in Howell and serves clients throughout Michigan. Insight is an environmental consulting firm specializing in a wide range of environmental services, including site assessments, groundwater exploration, groundwater discharge evaluations, compliance auditing, groundwater and soil remediation investigations, industrial mineral appraisals and wetland delineations and permitting.

**A. Linette McMonagle, CPG-09981**

McMonagle, has joined the URS Corporation as Environmental Business Line Leader for the Central Region. Ms. McMonagle brings over 15 years of environmental expertise to URS. She has a diverse background in hydrogeology, geochemistry, geology, engineering and environmental consulting, and is considered an expert in environmental due diligence, environmental compliance, environmental risk management, and brownfield redevelopment. Ms. McMonagle will be working out of URS’ Farmington Hills, Michigan office and will continue to serve clients nationally and internationally.

Ranked first in Engineering News-Record’s list of the nation’s top design firms, URS provides a full spectrum of environmental, engineering, architectural, and planning services to clients.

**Douglas Reynolds, MEM-0451**

Douglas Reynolds, MEM-0451, PG, was appointed to a 4-year term on the Board in September 2004. Doug is no stranger to the Board of Registration, having spearheaded its first newsletter and served as its first Communications Specialist.

Doug grew up with geology. His father earned a graduate degree in geology at Indiana University before the
family moved to Owensboro, Kentucky, when Doug was just a year old. Although born a Hoosier, Doug is rooted in Kentucky with his family ancestry stemming from the mountains of Eastern Kentucky. Doug was raised in Owensboro; he then followed his family’s tradition by earning a BS in Geology at Murray State University. He returned to Owensboro where he began learning the business of Petroleum Geology. During this time he continued his education at Indiana University, and earned his MS in Geology in 1987. From 1999 to 2002, Doug moved to Lexington and served as a Communications Specialist for the Board while employed by the Kentucky Geological Survey. Since then Doug has returned to Owensboro to continue a career as a consulting Petroleum Geologist with Reynolds Resources Inc. where he brings the geological perspective to oil exploration and production.

Doug currently serves as President of the Indiana-Kentucky Geological Society and is a member of the Kentucky Society of Professional Geologists and the AIPG. He is President of the Independent Oil Producers Association (IOPA), Tri-State. IOPA works with federal legislators and units of the executive branch to seek support for issues affecting the interests of small, independent oil producers.

**Dr. Thomas M. Scott**, CPG-04950, Florida Assistant State Geologist for Geological Investigations, has been elected as a fellow of the Geological Society of America. Tom was elected as a fellow of the Geological Society of America. Tom was elected to fellowship because of his exemplary record of publishing on Florida geology, administering geological programs, promoting public awareness of geology, serving in leadership roles in professional organizations, and for his editorial work. He is highly motivated and loves training the next generation of geologists.

**Laurie Scheuing**, CPG-09898, was recently elected to the position of President-Elect for the Association for Women Geoscientists.

**Barry A. Schwartz**, CPG-10421, was recently promoted to full Geologist (from Assistant Geologist) at the NYC Department of Design & Construction. The bureau that Barry is in became the Bureau of Environmental & Geotechnical Services as a result of a merger between the Subsurface Exploration Section and the Environmental Unit of the Bureau of Environmental Health and Safety Services.

**Jim Skehan**, CPG-01505, Weston Observatory, Department of Geology & Geophysics, Boston College, presented an invited reflection in Battell Chapel on the life and contributions to geology of Professor Emeritus John Rodgers of Yale University. John, age 89, as a member of the National Academy of Sciences, editor of the American Journal of Science (1954 to 1995), and an expert on “fold and thrust” mountains world-wide; his signature achievement in 1985 was the compilation of his “Bedrock Geologic Map of Connecticut.”

Jim Skehan also presented an invited illustrated lecture, “Introduction to Plate Tectonic Evolution of the Northern Appalachians” to the 41st Annual National Meeting of AIPG. The lecture traced the assembly and breakup here of three supercontinents in the past one billion years.

**Russell G. Slayback**, CPG-02305, is the recipient of the William B. Heroy J r. Award for Distinguished Service to AGI. The William B. Heroy J r. Award is given in recognition of exceptional and beneficial long-term service to AGI. This year’s recipient is Russell G. Slayback, president and chairman of the Board of Directors of Leggette, Brashears & Graham, Inc. Slayback has served three terms on AGI’s Executive Committee as member-at-large, president elect and president in 1999. Currently, he serves as chair to the AGI Foundation. His involvement with AGI’s publication Geotimes led to its new look, and as well he chaired AGI’s strategic plan committee.

Slayback graduated with a geology degree from Rensselaer Polytechnic Institute in Troy, New York. He became a consulting hydrologist with Leggette, Brashears & Graham, Inc. in 1960, and by 1984, became president. He has been a past president of AIPG and also currently serves on the Board of Trustees of the AIPG Foundation. The American Geologist Institute greatly appreciates Slayback’s contributions to AGI and its mission.

**Steve Stokowski**, CPG-06607, of Stone Products Consultants became President of the New England Society for Microscopy (NESM) on December 2, 2004. The NESM is a local affiliate of the Microscopy Society of America (MSA), and is a professional organization dedicated to the promotion and advancement of the science and practice of all microscopic imaging, analysis, and diffraction techniques.

Steve will serve a one-year term for the New England organization, notes that “NESM’s biggest challenge is to bring all users of microscopes into the current NESM fold of biologists, medical researchers, and material scientists. We must encourage conservators, archaeologists, and geologists to join and contribute to NESM so that all will benefit from the technology and techniques developed within each professional discipline.”
SCHOLARSHIP PROGRAM

Purpose
To assist students with college education costs and to promote student participation in the American Institute of Professional Geologists (AIPG). Up to four scholarships will be awarded to declared undergraduate geological sciences majors who are at least sophomores.

Scholarship Awards
Scholarship awards in the amount of $1,000.00 each will be made to eligible students attending a college or university in the U.S. Scholarships are to be used to support tuition and/or room and board.

Eligibility Requirements
Any student who is majoring in geology (or earth science), is at least a sophomore, and is attending a four-year accredited college or university in the U.S. can apply. Also, the student must be either a student member of AIPG or must have applied for student membership at the time the application for the scholarship is submitted.

Each student who is awarded a scholarship agrees, by accepting the scholarship, to prepare a 600 to 800 word article for publication in The Professional Geologist. The subject of the article must be related to a timely professional issue.

Application Process
Applicants must submit: a letter of interest with name, mail and e-mail addresses, and telephone number; proof of enrollment in an eligible geological sciences program, transcripts; an original one-page essay on why the applicant wants to become a geologist; and a letter of support from a faculty member familiar with the applicant’s academic work. The application packet should be submitted to:

American Institute of Professional Geologists
Attn: Education Committee Chr.
1400 W 122nd Ave., Suite 250
Westminster, CO 80234

For questions regarding the application process call (303) 412-6205 or e-mail: aipg@aipg.org.

Applications must be received by FEBRUARY 15th Awarded the month of SEPTEMBER

Basis of Awards
Awards will be based on the content and creativity of the essays as judged by the Education Committee. The decisions of the Education Committee are final.
The Importance of the Independent Experience

Nancy Price, SA-0382

As an undergraduate, a student is told what classes are best to take and what are the best things to do before graduation. More classes in calculus and statistics are best, and it never hurts to take an extra physics or chemistry course. Of course, one must also participate in at least one independent project or internship to complete their education. The reason for the extra classes is clear, but why is there such an emphasis on the independent experience?

Obviously, any independent project or internship at the undergraduate level has profound effects on a person’s resume or graduate school application. With more and more students continuing their education to the graduate level or beyond, it is no longer sufficient to simply obtain a bachelor’s degree. Therefore, entrance into graduate school becomes more and more competitive as each year passes. It is those students that show the drive and the ability to work and think independently that get the coveted spots at the graduate school of their choice as well as the research funding and assistantships to help finance it all. Independent research of any kind is a way to show a graduate school, or future employer, that you have the qualities that they want. Yet, just making yourself look good on paper is not the point of engaging in independent projects and internships.

Upon entering college, the typical undergraduate freshman gives very little thought to life after graduation. In many cases, a person may not even have a clue as to what to major in. The undecided major takes a variety of classes to perhaps narrow down what subject they like the most. For a few, that subject is geology. The next step is to dive into the classes required to complete the major. In the case of geology, that includes classes such as mineralogy, petrology, structural geology, sedimentology, and field studies. Suddenly the number of options increases exponentially. Do you want to be a seismologist? Or perhaps a hydrologist? Or a petroleum engineer? Or maybe even a paleontologist? A decision may not seem so easy at this point. Yet, those are not all of the choices to be made. Do you want to work for the government? Do you want to become an educator? Which level would you want to teach? Do you want to work in the private sector and, if so, what type of work would you want to do? Do you want to have a career in research? What area of research do you want to study? Will you need to get your PhD? ....and the list of options continues. All of this can be overwhelming for an inexperienced undergraduate. The fear of making the wrong decision looms in the back any student’s mind.

This is when the true purpose of internships and independent projects comes in. Perhaps a geology student feels that a career of research might be the way to go. The best way to find out is to participate in a research internship, such as one of the National Science Foundation’s Research Experiences for Undergraduates (REU). By spending a summer working on a research project, a student receives the first hand experience of what it is like to do research. For

continued on page 12
Making the Transition

Drew Nugent, SA-0310

It seems that, in today’s society, a basic college education will not get you as far as it used to. Because of this, we are seeing it become more common among today’s undergraduate students to pursue an academic career not only in a bachelor’s program, but in a master’s program as well. Making the transition into graduate school, however, can sometimes be a difficult one. The amount of work that is expected of you increases, classes are more time consuming and elaborate, and students are expected to develop and conduct a professional research project. Some students may have to teach classes on top of all of that. I, myself, am a first-year graduate student. I came from an undergraduate program which was smaller in both department and faculty size than the graduate program I am currently enrolled in. So what can be done to help make this transition to higher learning as easy as possible? Here are a few ideas that I found to be helpful in my transition.

When students look into graduate school, aspirations are always high. There are a lot of schools out there. Which one do you choose? Take a few things into consideration. First, look at the opportunities that are offered to that program’s graduate students. Visit the school and explore the area, meet with the faculty and other graduate students. Does the school have the type of environment you can work comfortably in, and are the people there the type you can get along amongst?

Another factor to consider is the location of the school. Where you will be living will play a larger role in your graduate experience. Make sure you end up attending a school in an area you enjoy. Rebecca Pressler, a first-year graduate student at Ohio University, comments on starting graduate school, “it’s very hard to start anew, but at the same time you have opportunities to travel, form friendships and start a new project. I really like the city the school was located in and it has made the transition fairly easy.” Being someplace where you are not comfortable will make any form of work more difficult.

Next, look at the people you would like to work with. Make sure your advisor has an interest in something you are interested in. This will make the work you have to do a lot more appealing and enjoyable.

Finally, decide whether or not you are ready. When a graduate school admits you into its program, they are expecting work of a professional caliber. Make sure you are willing to accept that commitment. The main reason you go to graduate school should be academically based.

All of these suggestions can help make your graduate experience a more enjoyable one. However, what you do once you get there is equally important. Make sure you communicate not only with your advisor, but other faculty members and current graduate students as well. Just like any new school, you are going to feel a little uncomfortable at first. Once you get to know people, things will get more comfortable.

Unless you have a research project waiting for you once you arrive at school, you should begin developing ideas about what you would like to research. Make a list of ideas, areas of interest, what you enjoy about those areas, other research you find interesting, and locations you would not mind working in. Once you have these ideas, talk with your advisor. This should assist them in helping you secure a project. Most graduate schools would like students to be developing a proposal within the first or second semester, so getting a head start will only make your life easier.

Another important thing a new graduate student needs to do is to stay on top of their classes. This is actually one of the more interesting parts of graduate school. Deric Learman, a second-year graduate student at Virginia Polytechnic Institute and State University, states that, “Classes are more interesting, because they are focused on what I want to learn.” This is true for nearly all aspects of graduate school. When asked about graduate school, Michael Strane, a first-year student at the University of North Carolina, said, “The best part of grad school is finally feeling like I have some control over my own academic destiny.” Remember, graduate students choose their classes, their project, and the way they teach their classes.

Finally, try not to stress yourself out. “I have about five times more work. Between taking classes, teaching classes, and working on multiple areas of research simultaneously, the stack of work is ever increasing,” says Strane. Many students will begin to find the phrase ‘all work and no play’ to be quite a common method of living. Even though there is a heavier workload, always try to find some time to relax.

Considering each or at least some of these suggestions can make the first semester of graduate school easier. In doing so, you will also be preparing yourself for the next semester. Remember, graduate school is a lot of work, but try not to let that scare you. All of the graduate students I have spoken to agree that being in control of your academics is the best part of graduate school. This is the ultimate chance to use everything you have learned in the first four years you served as an undergraduate. Adlai E. Stevenson Jr. said, “If we value the pursuit of knowledge, we must be free to follow wherever that search may lead us.” Do not let the thought of new work, new people, and new situations deter you from an even higher education.
Each academic year, student clubs/organizations on every campus go through a yearly ritual: the election of new officers. The mere mention of this can make most students sink into their chairs in fear of being nominated. However, the students who are eager for a challenge are the ones who take notice, sit up in their chairs, and hope to be nominated.

Student leadership roles usually entail additional time and responsibilities, as everyone is aware. You may ask yourself why should I take away from my coveted free time to simply take on more responsibility? I already have enough to do and besides, what do I gain by becoming a student leader?

Establishing yourself as a student leader early on in your academic career provides opportunities to excel during your professional career. As a student leader, you will be:

- exposed to various challenges and situations;
- given opportunities to work with a variety of people with varied backgrounds on an array of issues;
- provided a chance to test yourself and build upon established skills;
- able to better develop your skills in communication, organization, listening, and diplomacy; and,
- learn to take the initiative on issues as well as becoming a better communicator and above all, an influential diplomat.

The next time an opportunity arises where you can become a student leader, do not hesitate to accept the challenge, as this is the time to start on your successful professional career.

Getting involved with student clubs and organizations also presents professional opportunities; key words: PROFESSIONAL and OPPORTUNITIES. When involved with student clubs and organizations you will have opportunities to meet professionals in your field, learn about the work they perform, and network. While these are valuable benefits, they are priceless if you plan to remain in the community where you go to college or graduate school.

Meet professionals in your field. This is your opportunity to find out who the professionals are in your field and as you do, you will learn who’s who. This will be important, as your goal is to work with the best people at the best company in your field. Working for a reputable firm looks great on your resume while working for a company with poor ethics can damage your reputation. By meeting professionals in your field you will quickly learn which companies to pursue and which to avoid.

You will have opportunities to meet professionals and discuss the type of work they perform, their specialties, and maybe learn about their day-to-day tasks. Do not be shy about approaching other professionals, especially if you are interested in the type of work they do. They will be flattered and are generally very willing to talk to you. Heck, they might even have a job available that you would be perfect for! They may be looking for a part-time or summer hire, which is a great way to take a potential career for a test drive and see how you like it. You may love it and find your calling or dislike it and find a new direction to go. Either way you will learn about the professional world and learn more about yourself. Plus, it will look good on your resume.

Networking with professionals is critical in finding employment. Even if the people you know do not have any openings, they may know other professionals that are looking to hire. The more professional contacts you have, the better your chances are to land that perfect job, with the perfect company, in the perfect location. Well, ok you may have to settle for two out of three, but that is not too bad. The bottom line is, becoming a member or even an officer can be very beneficial to starting your career.

Christopher J. Pellowski, SA-0119, Economic/Exploration Geology
Scott L. Miller, SA-0251, Hydrogeology/Geological Engineering

Where Do Successful Professional Careers Start?

Christopher J. Pellowski (top photo) and Scott L. Miller.

Christopher J. Pellowski, SA-0119, Economic/Exploration Geology
Scott L. Miller, SA-0251, Hydrogeology/Geological Engineering
Ph.D. Students in the Department of Geology and Geological Engineering South Dakota School of Mines and Technology, Rapid City, SD.
To Current and Future Earth Science Majors

Tovah D. DiPrinzio, SA-0468

When you decide to attend college you inevitably get that standard form letter from your chosen institution that starts something like,

Dear Student,

Thank you for choosing... (this is where you would insert the name of your institution of higher learning) to continue your education. We are pleased to offer you a variety of opportunities that are afforded by your entrance into our ranks.

This is all well and good, but they fail to explain to you, the student, the magnitude of the endeavor you have chosen to undertake. Granted, if you did not like a little hard work and a little bit of a challenge, then in theory, you would not be applying to college in the first place. This is the lie I tell myself every day, that I WANT to learn, that I ENJOY staying up until ungodly hours of the night and waking up only a handful of hours later to start the day all over again. But this is the choice we have made as college students.

As students of the earth sciences, what they do not tell you ends up being more important than the hearty kick in the pants you receive the first day you enter “Introduction to the Earth” class. As a convert geology student, I was originally a bioscience major; I did not have to sit through all the introductory earth science classes. I did not even intend to take any geology courses, but I have always been fascinated with paleontology so I figured I’d like to take that class, see what it is really all about. However, in order to do this, I had to take the introductory geology course. I was told to avoid this professor or that professor, but I keenly ignored the advice and went ahead taking the intro course with a professor I had heard had a reputation for being difficult. I have always liked a challenge, thus one of the reasons I was attending college in the first place.

I am not going to sugar-coat it. The class was difficult at first, but once I got the swing of things, I did not have too many problems. The one problem I did face was that I wanted to spend more time reading over my geology notes than I wanted to spend studying for my anatomy exams. Hence, a new geo-dork was born. I rekindled my love affair with my old friend earth science. I do not want to make this melodramatic and morose, but I was rather lost at this point in my life. For most of my life I thought I would end up as a doctor and to most of my family, switching my major was a step in the wrong direction.

Here is a sidebar note for all of those wondering if geology/earth science/ watershed/ hydrology/ or environmental science was the right way to go. If it feels right, then it is. Follow your heart. For most earth scientists, myself included, it is not about the money. Sure being world-famous would be great, but it is about that feeling you get when you are at a road cut, or wading waist deep in a river. It is about the freedom you experience when you’re away from “normal” society; because let’s face it, no one in their right mind would be at that top of a sheer 80 foot cliff face or wading waist deep into 50 degree water if they did not have to.

The rules of science apply to you, but the earth is changing so rapidly around you that, like Heraditus, you never step in the same river twice. You never experience the same events twice. Each sample you look at is a snap shot of geologic history and that power, the power to interpret and understand something that took seconds to form and millions of years to come to pass, that power is the ultimate high. Maybe I sound a little like I have a serious case of megalomania, but it is true. You hold the past and the key to the future in your hands each time you look at a sample.

Your world-view changes, too. As an intro student, I found myself staring at road cuts while traveling home on the bus. It is enough to make one dizzy, but the headaches were worth it. As I got deeper into my studies, I learned about the geologic history of my hometown. I learned that all my life I had been standing on one of the key elements of the geology of the Hudson Valley. The Palisades Sill, as it turned out, ran under my back yard, right through my neighborhood. The idea that I had been that close to geology my whole life, that I lived in a county noted for its glacial soil, hence it’s name “Rockland,” made me so overjoyed I thought I would burst. I was so proud of who I was and where I came from. But that is not the point. The point is that you, as a student and human being, need to take stock in the idea that geology/earth science is the right choice for you. Have faith in the unexpected.

That being said, I recently graduated with my BS in geology from a small state college in central New York. I credit the professors, especially the professor who taught my “introduction to geology” class, for sparking the fire in me and allowing me to realize who I really was. I am currently a graduate student at the same college, trying to obtain my MA in earth science. The point of this whole dissertation is that, you never know what you will run into. I did not intend to be a rock doctor when I came into all of this. I did not know what I wanted; now I am very happy with where I am in life. So again, thanks to the professors of the SUNY Oneonta Earth Sciences Department and to one friend who gave me that push I needed to leap into that very first introductory course.
Floods, Technology, and Ramifications on Insurance Coverage

Sheral Kautz, Student
Professor Robert Pinker, CPG-04652

Flooding is a natural occurrence, but the negative effects of flooding extend far beyond what would occur naturally due to human interference with elements of the river's drainage basins and society's persistence in building in floodplains. Unfortunately, human beings have built cities along the riverbanks and on the floodplain, putting themselves in harm's way. Early settlers of the United States found the areas in the floodplains to be attractive sites for the first towns; not only was the land level and flat and ready to build upon, but, due to past flooding, the soil was fertile with organic matter deposited by the river as it receded from flood stage. The root and leaf systems of vegetation on the unmodified floodplain acted to slow the accumulation of rainwater and allowed more water to percolate through the soil before the saturation point was reached and run-off began. Large areas of vegetation, particularly forested areas, resulted in longer delays before full soil-saturation and the resultant flooding. Additionally, the rivers afforded ready transportation of goods from one town to another.

As urbanization increased, the profile of the land was changed from a natural floodplain surrounded by forests and vegetation-covered hills to paved cities with brick and concrete buildings and flat unprotected cropland. The combination of deforestation and the paving over of the land with asphalt and concrete resulted in cities more at risk for flood than ever before. Paved surfaces block the permeable soil from absorbing water, creating greater volumes of run-off in shorter periods of time (Coch, 1995).

Levee systems flooded, people redoubled their efforts to coexist next to the river rather than pulling back and building further from the floodplain. With channelization, river beds are straightened and smoothed in order to contain and control the portion of the river that flows through a local area. A deep, smooth, and straight channel can...
FLOODS, TECHNOLOGY, AND RAMIFICATIONS ON INSURANCE COVERAGE

The cause of the Great Flood of 1993 is simple - during June through August of that year, record rainfall amounts over a record duration of time saturated the soil and overtopped stream banks throughout the upper Mississippi river basin, resulting in massive amounts of water that overwhelmed the entire river system. The resultant flooding lasted over 200 days and affected as many as 150 rivers and tributaries (Larsen, 1996). Damages included the long-term flooding of water and power plants, massive sewer backup, the shutdown of major highways, airports, railways, and barge traffic, and the destruction of at least 10,000 homes (KDSK, 1993).

Though an extreme example, the Great Flood of 1993 provided a wake-up call for many cities in the region. In his presentation before the IAHS Conference in 1996, Lee W. Larson, the Chief of the Hydrologic Research Laboratory at NOAA, summarized key data that was obtained during the Great Flood of 1993: the unprecedented number and heights of the record crests of the Mississippi river at St. Louis, the lengthy duration of flooding at various cities along the Missouri and Mississippi Rivers, and the levee failure rates broken down between Federal levees (17.6% failed) and non-federal (77.5% failed). Despite the knowledge that was gained from this event, human nature cannot be fully convinced that change is necessary to avoid a repeat of disaster. Even during the height of the flooding, victims appeared on news reports bemusedly stating that they had to live somewhere and would return to a flood-prone location (KDSK, Inc., 1993).

MITIGATION

Individuals, and in some instances entire municipalities, often refuse to give up the fight against the floodwaters and simply move away. On a national level, flood damage costs are close to $5 billion annually (Kusler, 2004). With the partial success of the dam system initiative put in place by the Federal Government and the Corps of Engineers and the persistence of cities and communities in locating and remaining on floodplains, someone must pay this annual cost of damages. With the less-than-perfect results of the best technology that money could buy as far as physical controls to reduce flood loss, the next stopgap meas-

THE IMPORTANCE OF THE INDEPENDENT EXPERIENCE (continued from page 7)

some students, the data collection process can be tedious. For others, the constant paper and proposal writing is laborious. If a student were to spend a whole summer working in misery, then it is obvious which career is not for them. On the other hand, perhaps a student is interested in the private sector where they can practically apply the principles they have learned in class. In this case, working for a local consulting company for a summer would provide valuable insight. Perhaps that student does not work well with the customers or perhaps they decide that they want something more academic than the private sector can provide. It is better to learn these things now than further down the road when it may be too late to make a career change.

Internships can also provide opportunities for a student to gain experience with equipment that they may otherwise never receive at their home institution. Not every school can afford a scanning electron microscope, for example, and understanding how to use such a tool can be invaluable. Particularly in academics, the use of expensive sophisticated techniques and equipment is commonplace. Skills developed during an internship can make the use of such equipment or techniques at a later time, such as in graduate school, easier and less stressful. Not only can a student learn how to operate equipment, but they can also develop an appreciation for what that tool can tell the researcher or private industry worker. No matter how many times you read or hear in lecture that an instrument is vital to the study of a certain topic, unless you use that instrument, you may never fully understand why that is so. With that appreciation, a student can better comprehend the work done by colleagues and the studies reported on in scientific papers.

Another important benefit of independent experiences, such as internships, can be the personal connections a student can make. In some cases, it is simply a foot in the door with a job offer as a possible result. It is a chance to show that you have what it takes to comprehend the task at hand and complete the job in a professional and timely manner. In the professional world, sometimes a good recommendation can mean more than all the experience that your resume has to show. Temporary superiors can, therefore, serve as reliable sources of recommendations for job and graduate school applications.

Independent experiences therefore are a vital part to any undergraduate's curriculum. They can help fine tune a student's ideas about the future and make decisions easier to make. A good internship experience can affirm a career choice and allay fears. It can turn what may have been only an academic interest in a subject into a real professional direction. A bad experience can come with an instruction manual. A bad experience can come with an instruction manual.

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ure was a financial mechanism, insurance.

Originally, private insurers offered flood insurance to businesses and homeowners. However, the insurance operation depends upon the law of large numbers: the premiums of the many pay for the losses of the few. Over time, it became apparent that only those property owners who were likely to be affected by flooding were actually purchasing the flood coverage. By the early 1960's, the imbalance of the few paying small premiums and then being reimbursed large amounts for eventual flood damage caused a panic in the insurance industry. As a result, private insurance companies essentially stopped offering flood insurance.

In 1968, the Federal Government realized that insurance, as a device to mitigate flood losses, was no longer intact and developed the National Flood Insurance Program to provide a safety net for flood-prone buildings. The NFIP currently remains the sole resource for homeowners and businesses that lay within a floodplain and experience flooding. Using private insurance companies as a sales point and financial institutions to track mortgages on subject properties, a minimal amount of subsidized insurance is available to properties that lie within Federally-designated floodplains. The Federal Government subsidizes the premiums.

Hydrologists and civil engineers develop flood maps based upon the history of flooding and utilize formulas that include stream discharge, stage heights, and rainfall patterns. To qualify for the program, the property must be situated in an area that is calculated to flood at a recurrence interval of every 100 years. This translates to a 1% chance of flooding in any given year. Note that this interval is an average, and could mean flooding at this level in back-to-back years. With increased urbanization, it becomes critical that flood maps be monitored and updated. In areas with rapid and intense development, the removal of vegetation and addition of acres of parking and real estate construction can drastically alter the pattern of run-off and increase the potential for flooding.

A property with no historic record of flooding may be initially rated as a 500 year flood site; after a neighboring property undergoes site grading, the addition of retail structures, parking areas, and street and road access, the original property may now be subject to a 100 year, 30 year, or 10 year flood (Coch, 1995).

Recently there has been a pushback from taxpayer organizations and some legislators to force the NFIP into becoming self-supporting and not relying on taxpayer subsidies (Kusler, 2004). Part of the contention relates to the persistence of communities in building in floodplains, suffering destruction, and rebuilding again in the same spot, knowing that they will be compensated for any future losses. A bill is currently before Congress that is meant to put a limit on the number of times that a business or homeowner can collect from the NFIP before they must absorb some or all of the insurance costs on an actuarially
sound basis (i.e., the premiums are no longer subsidized by the government). H.R. 253, the Two Floods and You Are Out of the Taxpayer’s Pocket Act of 2003, is meant to reduce repeated claims at the same location (John, 2004). This bill is on the forefront of legislation being enacted to reduce what is seen as an unjust taxpayer burden.

Slowly, community leaders are coming to the realization that it is foolhardy and shortsighted to build in a known floodplain. The recommendations of engineers and hydrologists are given more weight than they have been previously; city planners and architects are incorporating buffer areas between creeks and the surrounding communities. As a local example, Mill Creek Streamway Park winds from the Kansas River south into Olathe; this extensive greenway system required commitment from developers and a willingness to give up valuable property to allow this buffer along the stream corridor in a highly lucrative area for real estate. Fortunately, homebuyers have flocked to purchase houses along this greenway due to the beauty of the natural surroundings. Developers now have a dual incentive to create these buffer zones in order to comply with increasingly stringent regulation of building on a floodplain, and to provide desirable properties adjacent to park-like areas and nature trails. However, the very powerful incentive of tax dollars generated from development in key areas adjacent to rivers still remains. Local governments push through commercial zoning in areas that will eventually be devastated by flooding. One only needs to look as far as the Corporate Woods office park, built uncomfortably close to Indian Creek, to be reminded how politicians can be swayed by short-term vision and economic incentives.

**CONCLUSIONS**

Technological advances in flood prediction such as satellite imaging, GPS, computer profiling, and the growing database of historic flood data provide a more credible basis than ever before for city planning. There is an unprecedented availability of information via the worldwide web on flood mitigation, flood insurance programs, and legislative issues. Despite this vast amount of knowledge and experience with the devastation caused by flooding, it is man’s peculiar trait to tempt fate by continuing to try to dominate and control Nature. The recent trends to set aside areas adjacent to rivers for more naturalistic usage, the growing publicity by lobbyists to reduce the flood subsidy burden on taxpayers, and the momentum in the legislature to tighten up the provisions of the National Flood Insurance Plan lends hope to the possibility that communities can achieve a planned coexistence with the beauty and danger of Nature’s rivers.

**Literature Cited**


**Responses to Questions from TPG Nov./Dec. 2004**

1. **As a member of AIPG, what events would attract you to attend/participate in the Annual Meeting?**

Never attended one! Why? It seems to be AIPG fiat to hold them in remote, small-market areas which are expensive to reach. If air service is available, the mark-up on air fares is outrageous. If the venue is within driving distance of a major airport, the cost of the rental car is more than the air fare to get part way there.

Since moving to Houston, and as a consultant in the oil patch, I can drive to the major meetings of concern to me (Annual AAPG, Gulf Coast Section of AAGP, Annual research Forum of the Gulf Coast Section of SEPM). I only fly to a meeting every other year.

Solution for AIPG. Meet the Western and Central Gulf Coast and I’ll probably make it!

2. **What attracted you to the Geological Sciences as a profession?**

T.ook a course with Joe Webb Peoples and Ruben J. Ross at Wesleyan and it appealed to me for a variety of reasons. Joe’s and Rube’s enthusiasm about Geology, my interest in the outdoors (I liked hiking, mountain climbing, canoeing, swimming, walking), and the opportunity to work on large-scale, multi-faceted problems about the origin of the larger features of this earth.

**George D. Klein, CPG-01487**
gdkgeo@earthlink.net
The President's Message

Robert G. Font, CPG-03953

Dear friends and colleagues:

Let me begin my first President’s message with a few words of thanks. First and foremost, I am indebted to all of you for electing me to this post. Thank you for giving me the opportunity to be of service to the AIPG in this capacity. I can tell you that I view the year ahead with much optimism. We have exhilarating times ahead of us at the AIPG!

I am proud of what we accomplished in 2004 under the leadership of President Bob Corbett. We are all thankful to him for his commitment and efforts. As Past-President, he will be an invaluable asset to our Executive Committee in 2005. I also express a heartfelt “thank you” to our Executive Director, Bill Siok. My friends, we are in very good hands with Bill in this critical position.

I want to state my gratitude to the rest of our Executive Committee for 2004. Rick Powers, Dale Nations, Ray Talkington, Mark Sweatman, Dave Abbott, Terry Rippstein, Ron Wallace, John Howard and Kate Kleiter. I thank them for their dedication and hard work. Last, but not least, I want to thank our headquarters’ staff, especially Wendy Davidson and Cathy O’Keefe. Their efficiency and support are certainly appreciated.

Next, I welcome our 2005 Executive Committee. Bob Corbett, Larry Weber, Kel Buchanan, Dave Abbott, Ray Talkington, John Bognar, Ron Wallace, Dave Palmer, Dan St. Germain and Jane Willard. I look forward to working with this able, dedicated and impressive group of professionals. It will be my privilege to do so.

As we begin the New Year, I will pursue four goals on behalf of the AIPG, since I believe that these are crucial to our future:

1) Strengthening the practical value of the CPG title.
2) Promoting continuing professional development or CPD.
3) Promoting our institute in the eyes of the general public.
4) Enhancing and growing student enrollment and student participation in all of our functions.

Let me briefly expand on each of these:

1) First, I wish to strengthen the practical value of the CPG title. There is no dispute about the honor that it is to hold the title of “Certified Professional Geologist.” But, realistically, the title has to mean more than that if it is going to survive, especially in states where registration has now taken root. We must put some practicality into the CPG title. My ultimate wish is for this title to translate into more money for those who have it and better opportunities for jobs, advancement and promotion for those who hold it. Currently, we have some ideas that we are pursuing that will hopefully, lead us toward that goal. But I assure you of this: if there’s any way to do this, we will find it!

One problem that I recognize is the fact that most people who hire geologists in the business world have no idea as to who we are in the AIPG and of the attributes that a CPG brings to the table. We are taking measures to better promote ourselves throughout industry, academia and government and to support our CPG members that seek either new jobs or promotion within their organizations. We also need to give new members a good reason to become CPGs. We will look hard at our membership services and to ways in which we can enhance the practical value of earning the CPG title.

NOW AVAILABLE!

AIPG History Book

Who were the “Magnificent Seven” who founded AIPG in 1962-63?*

After years of accumulating information, past-President Richard Proctor has finished the book, titled “A History of AIPG 1963-2003”; includes many photographs, a Who’s Who/Who Was Who in AIPG, and more than 70 selected speeches and papers by CPGs.

This 390 page book is available in hard cloth cover - $80.00, soft cover - $45.00, and CD - $15.00 (include $4.00 for shipping and handling for CD and $10 for either book).

(*The magnificent Seven who founded AIPG, by correspondence prior to the Organizational Meeting in September 1963, were Edward “Bud” Rue of Illinois, Frank Conselman of Texas, William Mallory of Colorado, Allen Tester of Iowa, Ad Honkala of Virginia, Robert Becker of Oklahoma, and Ben Parker of Colorado).
toward that end. One way that we can begin to fulfill that responsibility is through the development and accreditation of online courses. This would also provide us with an additional source of income for our organization that is above and beyond what we can collect from membership dues.

So, both the online courses and the CPD requirements are a very important part of our future.

On the subject of online courses, we are making much progress, thanks to the work and cooperation of our good friend, Dr. Detlev Doherr, Dean and Professor at the University of Offenburg in Germany. Because of the work that Detlev and I have been able to collaborate on over the past five years, the AIPG will soon have available a system to market online courses that is elegant and versatile, for a very modest investment. Our challenge will be to procure enough courses to make the system effective, both as a membership service and as an income source for the institute.

On the topic of promoting the CPD program, I would like to make the CPD quest worthwhile and attractive to all involved. To achieve this, I have already formally proposed to our National Executive Committee the implementation of discounts for our CPG members that participate and fulfill the CPD requirements as prescribed in our program. I want to see discounts applied to:

- Annual membership dues.
- Registration to the annual meeting.
- Purchase of publications from the AIPG.
- Purchase of any promotional item from the AIPG.
- Fees or tuition for any future AIPG-sponsored online course.

3) Third, I want to promote our institute in the eyes of the general public. We will find new means to do this to complement the various ways in which we are already addressing this goal.

4) Fourth, I want to enhance and grow student enrollment and participation in all of our functions. Students are simply our future. As an organization, the AIPG has to be very attractive to students, since we can offer the following:

- Exposure to highly experienced and knowledgeable geologists from all over the country from all geological disciplines; many of these being potential employers!
- In addition, we offer them the opportunity to meet professionals from other parts of the world and to extend their network of contacts.
- Entrance to a highly-prestigious organization that promotes geological practice and the advancement of the geological profession, the profession these students have chosen as their career.
- An opportunity, in time, to apply and obtain the CPG title and the honor that it brings.

It is definitely my goal to look at ways in which we can make it easier to establish new student chapters at universities all across our great country.

In closing, I restate my enthusiasm and optimism for what lies ahead for the AIPG. There is much work to be done. We need your help, your experience and your expertise to help us move forward. Thus, you have my personal invitation to join us in the exciting adventures that lie ahead!
Advice and Invitation

William J. Siok, CPG-04773

Dear geology students: As one gains more experience (gets older), one tends to feel more compelled to give advice to those about to enter the ranks of the working professional. For example, “Now that you’re so close to graduation, you should ...”. Fill in the blank, you get the picture. I think I will offer just a little advice and an invitation.

All working geologists have some advice to share with young graduates about career opportunities, the most interesting type of work, the most lucrative disciplines, the best places to be located, etc. I am at a point at which I do not remember too much of the advice I received as a young graduate, although I do remember the many geologists and others who told me to enjoy whatever work I chose. That is one good piece of advice I did not always follow as a young geologist. Geology itself was and is enjoyable, but there were times early on when the temptation to accept a lucrative job instead of a more professionally satisfying situation paying less won out. If you compromise with yourself, you may find it difficult to thoroughly enjoy your professional responsibilities, including the critically necessary relationships with peers and superiors. William Shakespeare said: “This above all: to thine own self be true, And it must follow, as the night the day, Thou canst not then be false to any man.” It is excellent advice and guidance for any career.

But I did not intend to be offering excessive advice to you who have probably had a basketful handed to you already. The real point I wish to make is in regard to your joining and participating in the professional community by belonging to professional organizations like AIPG and its sister societies. Many of you have begun laying the foundation for your active participation through your student memberships in some associations. You are commended for your interest and we appeal to you in the strongest terms to maintain your membership and active participation after graduation.

Certainly benefits accrue to you as student members of AIPG and sister societies. The fact is that benefits are even greater for those who retain ties and become professional members upon graduation. AIPG is particularly interested in retaining your membership, but also invites you as a post-grad to conscientiously continue membership in AIPG. As one of your professional activities, become active in your local AIPG Section and by doing so influence the decisions affecting AIPG’s future so that it truly is your organization.

However you choose to do it, stay involved! If you do, you will enjoy a bounty of excellent career and personal experiences. Most of you will find active association membership the sine qua non of your professional life. Often times association membership guides a career. Moreover, you are the profession’s future.

Test Your Knowledge

Questions for this issue are:

1. In the organic theory of petroleum generation, is it possible to generate gas directly without first generating oil?
   a) Yes
   b) No
   c) It is not possible to determine
   d) What?
   e) We need more seismic

2. Consider an infinite slope in a dry, loosely-packed sand with no cohesion. If the slope angle is i and the angle of internal friction is Ø, at what point will limit equilibrium be reached?
   a) When i = Ø
   b) When i = 2Ø
   c) When i = Ø/2
   d) When i = 3Ø
   e) None of the above

Answers on page 37.

Reflections on a Geologic Career

This fourth electronic edition of Reflections on a Geologic Career expands on the original edition prepared after the Colorado Section’s Student Day in 1996. It includes papers in the handouts distributed during the Student Days hosted by the Arizona and Colorado Sections in the fall of 1998. The oral origin of the papers is obvious and generally makes them easier to read. This electronic edition is to ensure wide distribution and use by students everywhere. Copy freely as long as proper referencing and acknowledgments are made.

Go to the AIPG National Website <www.aipg.org> and click on Publications in the top right drop down menu.
Delayed Report Angers Client

A member called me for advice. His small, aquifer testing firm had an exceptionally busy year. He was retained by a real estate developer to perform an aquifer test for a proposed subdivision. Although the required work has largely been completed, the report for the client has not been completed. The report’s delay stems from work being done for other clients that require the member’s direct participation and/or supervision. Although the member and developer have communicated on the report’s progress and status, the developer recently became verbally abusive as a result of the delays and made a variety of threats regarding potential actions the developer may take against the member. The developer’s angry and confrontational attitude has taken the enjoyment out of the project for the member. The member wondered what he should do. The member noted that he could use clerical and other assistance, but he does not want to hire additional staff at this time.

Having lots of work is something every consultant would like to have and it’s hard to turn clients away. However, Standard 3.4 of the AIPG Code of Ethics requires that members “serve their employers and clients diligently and perform their services in a timely manner.” Clearly, the developer client in this case feels that the member has failed to complete his work in a timely fashion. Although the member has communicated the situation to his client, the work has not been completed. The developer’s displeasure is understandable even if his attitude has become unpleasant. The member should complete the report, in a professional manner, as soon as possible. Although this may not be the time to hire additional staff, temporary staff may be an appropriate solution, particularly if clerical assistance is what is required.

The longer term consequences resulting from this case are hard to predict. The member clearly has one unhappy client who is likely to report his unhappiness to others. This may result in loss of future work. On the other hand, if other clients are satisfied, sufficient work may come from them and their referrals to keep the member’s firm busy.

What do you think of this case? Have you been in a similar situation? How did you handle it? Your comments and suggestions will be welcomed.

Certification vs Licensing-Who Demonstrates What?

In his letter to the Editor in the September/October TPG (p. 3), Robert A. Larson, CPG, asserts that CPGs do not demonstrate competence because “The current state of AIPG is a bunch of buddies vouching for their friends. Nothing is demonstrated.” I disagree.

Licensing in every application I have looked at also involves “a bunch of buddies vouching for their friends” by requiring attestations of competence and character in sponsorship forms. The sole difference in the application process for those unable to grandfather in a state is the ASBOG exam, which does nothing to demonstrate that actual practice will be done competently or ethically. Demonstrating that you know something differs from demonstrating that you can and do effectively apply such knowledge.

Larson also asserts that because AIPG is constantly trying to increase its membership that a conflict of interest exists by implying that the membership screening process is less rigorous in order to add to the membership roles. I wouli not deny that some could agree with Larson’s perceived conflict of interest, but I do challenge its reality. I do not claim to have looked at every CPG application, but I do know that applications are regularly rejected due to failure to demonstrate appropriate education and experience. The names of all applicants for CPG are published for member comment. Opposing letters are occasionally received and the allegations contained are examined prior to admission of the applicant.

The critical point Larson does not address in comparing certification and licensing is demonstration of what happens when allegations are received that a certified member or licensee has acted incompetently or unethically. Some certifying organizations and states do take effective action, others do not. I know that AIPG does take action because, as Ethics Committee Chairman, it is my responsibility to see that it does. And I see that a summary of all cases brought to the Ethics Committee Chairman’s attention each year is posted on AIPG’s web site.

I also know from personal experience that getting some states to take disciplinary action against a geologist or other professional for incompetent or unethical practice—in contrast to not having a license—is very difficult. This situation results from the common fact that state regulatory boards depend on the assistance of the state’s attorney general’s office for conducting investigations and disciplinary proceedings. Proceedings that involve the difficult issue of determining if someone, who is presumably an expert, practiced incompetently or unethically is not what the fresh-out-of-law-school members of a attorney general’s staff want or are encouraged to take on. How many candidates for attorney general campaign cite their willingness to ensure professional practice and most other forms of white collar crime? In my experience, attorney general candidates generally campaign on their ability to be tough on other types of crime.

As a specific example, I filed an allegation against a geologist licensed in one of the states in which I am also licensed. The allegation stated that the geologist had lied during a deposition and I included copies of the relevant pages of the deposition with my letter making the allegations. A disciplinary action was never seriously undertaken in this case. In a subsequent conversation with one of the members of the state’s licensing board at the time, the ex-board member told me that one of the chief reasons that he declined further board service was the failure of the state attorney general to take effective action in cases like mine that appeared to have a solid basis for...
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Proceeding due to prosecutorial discretion and resource limitations. In other words, prosecuting incompetent or unethical professionals is not high on the priority list.

I therefore challenge everyone who claims that state licensing is better than peer certification because the state will take action against violations to demonstrate the validity of their assertion. In my experience it is not necessarily so. I also challenge all those belonging to peer-review certifying organizations to similarly ensure that their disciplinary or grievance procedures are being effectively employed.

In either case, the first step in any disciplinary action is reporting supported allegations of misconduct or unethical practice to the appropriate body. If an organization is not informed about a problem, it cannot act.

Continuing Professional Development—AusIMM’s Experience (Nov/Dec ’04)

Tom Fails responded to my comments on AusIMM’s experience with CPD compliance in the last column with the following remarks. “Thank you for reporting on AusIMM’s CPD program and their disconcerting reports of CPD participants. Since AIPG’s proposed CPD program differs in a number of ways from AusIMM’s, as described below, I am hopeful but will remain watchful, as will the Ad-hoc CPD Implementation Committee, when Annual Reports are being reviewed.

“However, the differences built-in to the AIPG CPD Program should minimize or prevent abuses of the types described in your report regarding AusIMM’s experience.

“1) Our program is voluntary, not mandatory. Further, as I understand it, if one loses one’s ‘chartered’ status in Australia, the consequences are severe compared to those not obtaining CPD Advancement in AIPG.

“2) Annual reporting and judging, rather than a more measured three-year-period program before a review, are very different. With three years, time to catch-up exists, while within a single year it is more difficult to accommodate a major, time-consuming problem.

“3) As to attendance at geoscience conferences or conventions, we allow the participant to obtain 1 to 3 PDPS for just attending. The remaining potential PDPS are based on Contact Hours for one or more talks, field trips, etc. Hopefully, the Contact Hour basis will prove to be workable and more honest than the present Aussie approach.

“4) AIPG’s approach to joint papers, etc., does not take hours into account. Rather, the Single Author versus Lead Author approach with Co-Author’s approach is used, with different allocations available through petition. Frankly, my experience with joint papers is either 1) two authors may make relatively equal contributions (Susan Landon and I as an example), or 2) the other extreme, where Senior Author does most of the work (again, a personal experience regards my diapirism book, where I, as Senior Author, did more than 80% of the work, with the co-authors at about 10% and 8% respectively). We use the length and nature of the publication as well, as a weighting factor to reflect the enormous amounts of work that can go into a 30-page article with a Lead Author and 4 or 5 Co-Authors. Not a perfect solution, but no objections so far.

“5) I do differ a bit re: skills enhancement versus skills extension. To the degree the Participant has enhanced existing skills by continuing practice with resulting improvements, I do not believe that skills enhancement should never be taken into consideration.

“Again, ours is a voluntary program. In the end, this may turn out to be one of our strong points, together with the breadth and flexibility characteristic of AIPG’s CPDP. Hope so!

“We are bound to learn a lot during our first 3 or 4 years of CPDP operations. Providing the CPD Standing Committee remains flexible and adaptable, our program should flourish. But, if the Standing Committee becomes a Standing Bureaucracy, the Institute and our hope for bringing meaningful support and improvements for professional geologists may suffer severely.”

Conflict of Interest—Bidding on Previously Recommended Work

The following question was sent to AIPG headquarters and was passed on to me for a response, which follows the question.

“A geotechnical consultant prepared a routine soils report for me as part of a building permit requirement. The consultant prepared the report and included substantial follow-up and oversight recommendations during construction. Am I wrong in assuming a major conflict of interest by having the same consulting company requesting to conduct the follow-up work? I am myself in the environmental consulting field, and I find it unacceptable for the company that prepared the soils report to be rewriting themselves into the recommendations for construction supplemental services. What are your association’s professional ethics guidelines in cases like this? I am accustomed to being excluded from bidding on a project that I designed for good reason: It prevents tendencies, intentional or not, to influence the scope of implementation or follow-up work.”

Conflicts of interest are perhaps the most common ethical dilemmas that face practicing geoscientists on a regular basis. AIPG’s Code of Ethics; Canon 3 generally and Standard 3.1 in particular address conflicts of interest. The first step in conflict of interest cases is identification of the potential conflict. This you have done. Generally, the next step is disclosure of the conflict to the interested parties, those who might be adversely affected by the conflict, so that they can determine whether, and in what ways, the identified conflict of interest is truly a matter of concern, and, if so, what steps can be taken to avoid or mitigate the problem. There are some cases, audit functions for example, where no conflicts of interest are allowed. But in most cases, disclosure and discussion lead to satisfactory resolution.

Turning to your specific case, a consultant recommended specific follow-up and oversight work. Was the recommended follow-up and oversight work reasonably justified? Would the recommendations be followed regardless of who performed the follow-up work? Or, is there some reason to believe that the recommended follow-up work was padded in some way? If there is no suggestion of padding and the consultant is competent to do the work, then, if all interested parties are aware of the potential conflict of interest and have no unresolved objections, the consultant’s bid should be considered. In fact, because the consultant has already done work at the site, he may be able to perform the work more quickly because of this previous familiarity.

I teach a short course on professional ethics and the following situation was described during the discussion at one offering. The leader of an ethics course some years ago stated his opinion that a firm should excuse itself from bidding on a job for which it has unique, site spe-
If the lowest-bid is always the winner, then procurement would always favor the scientific minimalist. The question of how much money should a project take to be considered valid is raised.

“Currently anyone in the US may search for professionals, for example lawyers, plumbers, etc. by calling them up and asking them for their hourly rates. And other professionals in the same business know their competitors rates. Predicting how long something might take to complete and the hourly rates of employees are the biggest variables that are eliminated by open bidding. And finding the cheapest source of materials for a job is also a company’s trade secret. A bid for a time and expense contract gives the consumer an exact idea of what they will get but not necessarily how good it will be. We as individuals are forced to procure services in a semi-vacuum by not having the time to request bids for these services, unlike buying goods at the store, and apparently unlike these agencies employing an open bidding system.

“The real question here seems to be is it ethical to allow a company’s competitive edge, its pricing, become public knowledge to allow others to compete and take away income by winning a competitive bid. On that argument alone, it seems like a valid way for an agency to do business. The company can always choose not to compete for the open bids and not reveal their business structure.

“It seems like a good idea to use an open bidding process, but also seems inherently distasteful and counterintuitive to developing a scientific study. I am not sure if AIPG needs to take a stand.

Perhaps there is a better way to spend less money and still maintain the rigor of a study without devolving into an issue of competition for the cheapest service provider. In the American system, we often hear the phrase ‘you get what you pay for’ but only the procurer can decide for themselves if they are getting what they expected through this particular system. Maybe the system will prove by experiences to be a bad idea and as a result open bidding for professional services will not become standard industry practice.”

The potential that reverse auctions and similar arrangements induce for performing less than optimum professional work in order to save money on a low bid are the basis for the provision prohibiting price competition in proposals for professional services that used to be in many professional ethics codes. These provisions were removed in the late 1980s following antitrust actions by the Federal Trade Commission against several professional societies. Nevertheless, the potential for encouraging subprofessional work is inherent in a low-bid-always-wins system. Reverse auctions appear to exacerbate the problems.

Again, I encourage you to contribute your thoughts and experiences on this topic.
What Should a Student Expect from a University Geology Department?

Allen W. Hatheway, CPG-02426, Consulting Geological Engineer, Rolla, Missouri & Big Arm, Montana, Allen@Hatheway.net

A University education is a two-way street; students marching from one direction and the faculty moving along from the other direction. There are many opportunities to be encountered along that street, as well as some “diversions,” in the form of playgrounds, dark alleys, dens of iniquity, and some dangerous traffic.

The trip down the street of academia seems direct, save for the aforementioned “diversions” and dangers, but hardly any student is so poorly oriented but that he or she expects to receive certain benefits and privileges related to graduation and the diploma, to be granted at the bleachers put up at the “end of the street.”

Your author would be the first to admit that his undergraduate education was not only demanding but somewhat confusing as to the benefits to be gained by making this grand effort to qualify as a member of a scientific profession.

In fact, if we all “were so smart” as to know exactly what it is that we wanted to do in life, that is in the pursuit of a career in Geology, we would have perhaps more adroit at taking advantage of our undergraduate experience.

Looking back on those years, I have no difficulty in setting down some of the points that I would emphasize, even to myself, if I were to start all over again at the beginning of the next semester.

There are some things you need to know ….

North American universities are morphing rapidly, from “institutions” of higher learning, into “businesses” for that purpose. No longer do universities serve their student bodies through just a hard-working departmental faculty, but ever-increasing percentages of the higher-education dollar are going for layers upon layers of administrative bureaucracy and for all manner of services and programs, mostly mandated by politicians who have neglected to fund their mandates.

The result is that the administrative fat has diverted alarming percentages of the annual budget that once were set down to teach and train students. All the while, the public institutions are suffering from legislated reductions in funding, while monies are sucked away for social programs and repair of aging infrastructure.

Consequently, year-by-year, each public university finds itself needing to provide slightly more of the ever-reducing budget. That money comes from two sources, 1) increased tuition, and 2) a flogged faculty made to search near and far for off-campus money to fork over to the administrators. By the way, administrators are paid more than faculty and generally are notoriously incompetent at raising their own support funds.

Consequently, the campuses flog the faculty, raise your tuition, and seek to garner more students. The U.S. Army was vilified in the Viet Nam war over the issue of “body count,” but, true or false, the concept has a new life with the university administrators.

Where does this leave you, the student? In the driver’s seat, I would say, that is, if you are “worth your salt” and show promise to perform well.

The Nature of Geology Departments

Geology departments are collections of professors brought together under generally strange circumstances in which times are always changing and faculties are always maturing and changing. Because of those influences, here are some points that come to me:

• The “character” of a department will change dramatically about every generation;
• You should not choose your department on the basis of the university’s reputation on the playing field;
• Bigger is definitely not “better;”
• You are going to have to gain a master’s degree in order to fulfill most of your personal goals in life (and there are outstanding exceptions to this rule; meaning that truly outstanding persons are more valuable for their energies and traits than a graduate degree can impart); and
• Universities today are “hungry” for truly good students and you will not be denied somewhere, if you have basic intelligence and a performance-based ethic.

Judging a University Geology Department

Picking a department ought to be accomplished at least partially on how that department treats you as a prospective student. It is a proven fact that a prestigious university can do “wonders” to improve the capacities of their own graduates, primarily by the name association.

What’s in a Name?

Who is to argue with the practical fallout of this association. The phenomenon is greatest for lawyers, who know that graduation from a prestigious campus assures a permanent hire immediately upon graduation? Being an editor of the prestigious university’s law journal will
add a few tens of thousands of dollars to the offer of an annual salary, perhaps even enough to afford living in a major city.

It also is a fact that an otherwise bright, competent and energetic law school graduate can overcome the lack of the aforementioned credentials by way of about four years of productive duty with a public agency, then to be noticed by the opposing law firms dealing with the agency.

Not so for geologists, but there are some strong parallels.

**What About The 'Big Names' In Academia?**

Running an institution is a frightful-ly expensive venture! The fact is that there are just four basic types of universi-ties out there now:

- Prestigious, well-endowed private schools, the name of which will open doors for you, not just on your first job engagement in geology, but for the rest of your life;
- Big State Research Universities, most of which are really struggling under reductions in funding from their State Legislatu res and what Federal grant money remains (not much);
- State Teaching Universities; all of which are really struggling under reductions in funding; and
- Small liberal arts schools, some with small but very attentive geology departments. Here you may well receive an excellent undergraduate education, depending on the nature of the faculty, but may need a MS at another school in order to capitalize on your capacities.

**Pick a Department that Suits Your Own Capacities and Dreams**

As an undergraduate, I could not con-ceive that anyone would take such a beating as to graduate in geology and then not go on to practice in the profes-sion. The fact that my Geology class (1960) sent 17 members of its summer field camp (second of four field mapping classes) and today but six can be counted as having made geology their career (Hatheway, Sznyter and Nokleberg, 2005). I think that such is about as accu-rate a survival rate as one will generally encounter on the far side of a career in Geology today.

So the question is, do you really intend to make a career in geology? Army General Collin Powell was a Geology undergraduate of CCNY and went on to use his undergraduate training only in a peripheral way, though he now, as the American Secretary of State, flies over more geology than any of us have seen or will ever see!

**Get “Real” About Yourself!**

In reality, come to the conclusion of your guiding priority, a bachelor’s degree or an entry to a lifelong calling in the profession of Geology.

Even today, North America trains more graduate geologists than can be absorbed for career employment. Somehow, we do not want to realize this basic fact. However, the other side of the issue is that a good degree in Geology is one of the finest preparations for life, especially if you are likely to come into family money or to inherit a family business. In those cases, why worry?

If you are determined to become a professional Geologist, have a look at the qualities displayed in Table 1. These are universally respected hallmarks of successful people, but know a bit about yourself before you start seeking counsel.

For those of us who are determined to practice, the trail takes a distinct turn. It is my profound belief that North America will have geological career employment job for you, and perhaps it will be in the general field of environmental protection, where the rewards are abundant in job satisfaction and minimal travel away from the family. Don’t overlook this high-ly worthwhile avenue, both at the Federal and State/Provincial level.

Either way, you can receive a quality geologic education from any dedicated faculty of three or more. You will need a Master’s degree in any event, and should you do well at the Baccalaureate level, you will be welcome at most if not all of the “name” departments. Surely if you have something to show for the quality of your undergraduate geologic educa-tion, you will be an attractive candidate for nearly any graduate department. If you have one or more sponsoring faculty members who are willing to nominate

<table>
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<tr>
<th>Capability</th>
<th>Manner of Use</th>
<th>Career Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive</td>
<td>Will you be a self-starter and require only direction and a bit of counsel?</td>
<td>Highly desirable! Generally known as “fire in the belly” toward wanting to become a practicing geologist</td>
</tr>
<tr>
<td>Persistence</td>
<td>The ability to meet and conquer adversity. Your geologic career will be laced with adversity.</td>
<td>Transforms into the ability to complete difficult geological assignments accurately and on time</td>
</tr>
<tr>
<td>Dedication</td>
<td>Will you have the commitment to complete your studies and to gain professional licensure as a professional Geologist?</td>
<td>Without these completions you will not be qualified for employment and advancement commensurate with your formal education.</td>
</tr>
<tr>
<td>Reliability</td>
<td>Being able to meet commitments and to do so without whining.</td>
<td>You are your own sales person and without that sales person you cannot hope to meet most goals associated with professional practice.</td>
</tr>
<tr>
<td>Communicative</td>
<td>Being able to speak, write, and present facts and concepts to those who would engage you as their Geologist</td>
<td>Geologic facts and findings are particularly difficult to transfer to non-scientists, and particularly so to politicians and public officials, yet they are the forces driving much of our work as Geologists.</td>
</tr>
<tr>
<td>Innovation</td>
<td>Truly, thinking “out of the box” when faced with new situations; which for Geologists is every new field site!</td>
<td>A real commodity for sales of services provided by your organization, to clients who will pay for your enjoyment of “being” a Geologist.</td>
</tr>
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</table>
you and to provide some substantial reference assessments, you are sure to be rewarded by admittance to the department of your choosing.

Getting “Real” About Field Geologic Mapping

This author has a real devotion to the notion that all practicing geologists should be particularly adept at field geologic mapping. But, such is not the case in reality. Many university departments are no longer capable of teaching field mapping techniques, for two basic reasons: 1) Some can no longer afford the relatively high costs and liability constraints of conducting even so much as weekend mapping exercises, and 2) Some faculties have migrated from the field and into the lab to such a degree that the faculty themselves are no longer capable of gathering and recording field data.

My advice is to seek some advice on this subject from seasoned professional geologist practitioners. That raises the need for you to “network” for counsel.

Networking

Surely you are aware that this one factor in life has got to be right up there near the top in terms of how you can affect your own future. Here's where AIGP comes in....Now that you are reading this journal, just take the next short step and call or e-write Headquarters and ask to be put in touch with an AIGP member in your area, a person with whom you can begin the networking that will help you choose your Geology department or the next one or begin your job search.

What Your Faculty Owe You

If you are right now already a geology student, you have an unwritten bill of rights of sorts. Your faculty are members of the same profession for which you are training and, in my frame of mind, these folks not only owe you the time of day for some serious advice and counseling (and, I am not just talking about how to live with the University’s curriculum) on how to prepare for and to launch your career.

Try applying the elements of Table 2 to your own personal evaluation of your present or future faculty.

The Really Big Question

Taking all other factors into consideration, it comes to me that the truly big personal question each of us has to deal with, as students, is which corner of the “box” suite you?

• Analytics vs. Concepts
• Field vs. Lab
• Academic vs. Practice
• Public vs. Private Sector

In fact, there probably are in fact, two “boxes”. Or, considering that “boxes” are really cubes, with eight corners, you could construct one box with one of these end pairs at each of the eight corners. Know where your personality falls and be able to point this out to Department faculty and to all others from whom you would seek counsel.

<table>
<thead>
<tr>
<th>Quality</th>
<th>How to Judge Them</th>
<th>Value to You</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended by Practicing Geologists</td>
<td>Contact the local AIGP membership for advice</td>
<td>Separate yourself from less dedicated students; show yourself to be worthy and in need of faculty advice.</td>
</tr>
<tr>
<td>Does the Professor Show an Interest in You as an Interviewee?</td>
<td>Know something about their individual teaching and research interests, by reference, before you meet with them. Ask the Department office for a resume of the particular faculty member.</td>
<td>If the faculty member has no time for meeting and counseling you, you should get wise and have nothing to do with that person in future classes. Is this faculty’s specialty a line of geological work that would interest you as a career?</td>
</tr>
<tr>
<td>Explaining to You How You Might Select a Geologic Career Specialty</td>
<td>Detect any fundamental interest in you as a candidate and about how it is that you might practice in Geology</td>
<td>Test you own capabilities and capacities as you know them to be. Will you likely find the geologic specialty to your liking and satisfaction?</td>
</tr>
<tr>
<td>Their Personal Level of Enjoyment and Satisfaction at Being a Teaching Geologist</td>
<td>Does the faculty member display believably honest enthusiasm for his/her work or specialty in Geology?</td>
<td>Match you own personal outlook on life and what you know of your own basic levels of dedication, drive and determination. Will this Department serve your personal interests and capacities? Is this career emphasis what you want?</td>
</tr>
</tbody>
</table>

Summary

Geology students or prospective Geology students should seek career preparation advice from practicing Geologists. The AIGP organization stands ready to offer you the insights and networking connections gained from infinite years of hard work and lessons learned. Find out where a local meeting is being held, call ahead, and ask to be announced as a guest in need of counsel and advice!

Reference

Hatheway, A.W., Sznyter, S., and Nokleberg, W., 2005, UCLA Summer Field ’1960—Ultimate Fate of an Undergraduate Geology Class: Dept. Earth & Space Sciences, UCLA, Los Angeles, CA, website and on file in Department library, 15 p. The author welcomes discussions to be printed in TPG. A foremost objective of this series of opinion papers is to foster thought and development of personal positions on matters or issues, be they technical or ethical. Allen Hatheway promises to respond in print to all such commentary.

Allen Hatheway (allen@hatheway.net) is an early-retired Professor of Geological Engineering who has practiced for 44 years, in his native Los Angeles, and at San Francisco, Boston, and in Missouri. He has served his profession as a teacher, soldier, public servant, and consulting firm staff and partner. He is professionally licensed as Geologist and/or Engineer in several states (AZ, CA, MA, ME, and MO), but swears that his formal education has been strongly tempered in the School of Hard Knocks. He serves as one of AEG’s ambassadors to AIGP, as an Honorary Member (2002) and past-president of the former (1985). He and wife Dina split their time between Big Arm, Montana and Rolla, Missouri.
Project Management

Is this thing on? Is anybody listening/reading this column? This starts my second year writing this column. To date, nobody has submitted a single comment of any type. I would have expected some sort of reaction from somebody out there. I have a couple of theories about the lack of response to the column. One is that maybe nobody reads this column. I hope that is not the case. Although I will admit that when I was in consulting, I do not know how likely I would have been to read and/or comment on a column on risk management. But there are times when for lack of anything else to read, you go back and read those sections of a magazine that you were not initially interested in. Another explanation is that people are reading it but they completely agree with my opinions. While my ego likes this second explanation, I realize that my column contains my opinions and that there are people with alternative opinions. I was truly hoping that this column would generate some comments and discussions similar to David Abbott’s Ethics column. To be honest I am hoping for comments for selfish reasons—it is difficult to come up with topics in a vacuum. I have to make assumptions on what would be of interest to the membership. So I am asking for some comments whether positive or negative. If you have any questions about professional liability insurance, claims, or any risk management related topic, please send them in. Now, back to our regularly scheduled programming:

**PROJECT MANAGEMENT**

Building on the last two articles, I reviewed employee selection and retention and client/project selection. So now you have your staff, you’ve selected your clients and are starting on some projects. The next risk management issue is how to manage the project.

**Financial management**

One of the first things to consider is how to manage the financial side of the project. Too often this aspect is an afterthought. Most technical consultants whether geologists or engineers or others are so focused on the technical that they forget about the financial aspects. You will want to review the contract language for payment clauses so that you are clear on what you have to submit to the client to receive payment and to know what to expect in terms of timeliness of payment from the client. You want to reduce the chance that the client can refuse your invoice because it was not formatted as per the contract or it was sent to the wrong address. Remember that if cash is king, cash flow is benevolent dictator for life. A consulting firm is not a bank. You typically are not going to be able to collect interest on outstanding moneys due from a client. Clients who are late in paying may cause your firm to have to incur interest expenses on short-term loans just so you can keep operating your company.

Review how your firm tracks project billings. One of my employers when I was in consulting, provided project managers with a weekly update on budget and who billed time to my project. This allowed me to do a couple of things. Firstly, I could see who was billing hours to my project. If there was an issue where someone wrongly billed to my project or overbilled time to my project, I could deal with that right away rather than wait until the end of the project to try to figure things out. Secondly, I was able to keep up with how I was doing budget wise on each phase of the project so if there were going to be budget issues I could deal with them quickly. The earlier you can notify a client of budget issues the better. Now anytime you have to tell a client that you need to file a cost change they will not be happy, but it will go a lot better if you deal with them as they occur rather than waiting until the end of the project to inform the client of the overage. I like to use the following analogy to illustrate my point. If you throw a frog in a pot of boiling water, they are going to scream and jump out (this is the client who gets hit with one big change order at the end of the project). However, if you throw the frog in a pot of room temperature water and slowly turn up the heat, by the time the frog realizes what is going on he is already cooked. Now I am not suggesting that our clients are frogs and that we should cook them, but if you keep the client apprised as things happen, by the time they realize that have approved all those change orders it is a little late for them to raise issues.

**Staffing Management**

The key here is to make sure you have the right staff on the project. The talents and experience of your staff varies. Some folks make excellent field personnel who can think on their feet and make intelligent decisions in the field. They may also be good at dealing with clients and subcontractor personnel in the field. There are other folks who should not be allowed out of the office because while they are very competent technically, their interpersonal skills or other skills just do not pass muster. Consulting is a very relationship based business so having the wrong personnel on a project can cause some serious issues.
If it is a long-term project with lots of overtime hours, examine how stressed the employees who are assigned to that project might be. We have all had those infamous “two week” assignments that drag on into months. At one of my employers we had the company field factor where you took whatever time frame that the project manager told you, doubled it and added two weeks to arrive at the true length of the project. While we never did a statistical analysis as to how correct the field factor was, it seemed to be as good a predictor as possible. But back to stressed employees. If there are working day after day 10 plus hours of fieldwork for weeks and weeks in a row, there is an increased likelihood of errors creeping in. Be sure to plan for rotating folks in and out of the project where it makes sense.

File Management

This is probably one of the most overlooked aspects of project management. In many companies, there is no uniform filing system. Each project manager is permitted to develop their own. This leads to a great variation in file set-ups. We have all worked with (or may be the classic example) with people who use what I call the “file by piles” method where there is not a manila folder in sight and every piece of paper is stacked on top of what is supposed to be their desk. I have seen some of these folks be very effective in applying basic laws of stratigraphy and be able to find a document that was put in the file back on September 5th. But what happens when there is slope failure. It is unlikely that the stratigraphic column can be accurately reconstructed. The problem with folks who file this way is what happens when they are out of the office and someone needs to find a key file item. Good luck trying to go through all of those piles and finding what you need.

Being able to find a key document is one of the main reasons for developing a consistent filing system within a company. People may be out of the office or leave the firm but those still in the office will need to be able to easily and quickly find documents. One firm I worked for use a six-part binder clip folder with a label on the front stating which section had the accounting data or the lab data etc. The theory here was that regardless of which project manager or which office worked on the project any other company employee should be able to quickly locate key documents.

There are other issues regarding file management such as what should be kept in the file? What should not be kept in the file? How long to keep the file? What about employees’ personal job files? I will leave these for a future column.

Application for Affiliation as a Student Adjunct

Complete ALL sections. Read the Bylaws and Code of Ethics. If applying between November 1 and June 30, the application fee is $20; if applying after June 30, the fee is $10. Please PRINT OR TYPE.

Last Name: ______________________ First Name: ______________________ Middle Initial: ________

College/University: ______________________ Geological Degree: □ BA □ BS □ MA □ MS □ PhD □ None Year: ________

Address: ______________________ City: ______________________ State/Zip: ________

School Phone: ______________________ Home Phone: ______________________ E-mail: ______________________

ATTESTATION: I attest that I meet the requirements for AIPG Student Adjunct (currently enrolled in a geological science degree program) and agree to abide by AIPG Bylaws and Code of Ethics.

Applicant Signature: ______________________ Date: ________

Faculty Sponsor’s Statement

I certify that I am a member of the faculty of the ______________________ department at ______________________, with the rank of ______________________, and that the statements made by the applicant in this application are true to the best of my knowledge or belief. I am ___/am not ___ the applicant’s faculty advisor.

Name: ______________________ Phone: ______________________

Sponsor: ______________________ Date: ________

STUDENT APPLICATION FORM
The Importance of Experience

Tristan H. Jones, SA-0433

At many schools across the nation, a geology major’s field camp is considered the capstone of their education within the discipline. Attending field camp provides very useful experience dealing with various rock types and landforms in-situ, teaches the skills needed to make accurate geologic maps, and generally sharpens the abilities of a young geologist. It also serves as a method of passing on and building excitement about geology within the individual. Most importantly, it serves as a platform from which a student be exposed to other possibilities that truly hone their abilities and provide a much clearer image of what mapping geology is actually like.

Perhaps my experience with field camp was unusual, perhaps not. I attended field camp during the summer of my junior year at Central Michigan University. For the vast majority of people around me field camp was their only remaining class before graduation. I whole-heartedly congratulate them on their successful completion of an undergraduate degree and wish them luck in their respective futures, but at the same time, I now know that they could have come away with so much more had they taken field camp a year earlier, or continued their education a bit longer. Instead of making field camp the capstone of a student’s education, I propose an alternative: a truly individualized research project or internship.

Before my final year at CMU, a remarkable experience was brought to my attention. The Educational Component of the National Cooperative Geologic Mapping Program administered by the United States Geological Survey, also known as EDMAP, is a program with the primary goal of training young geologic mappers. This is done by providing graduate and selected undergraduate students with grant funding for research projects that include geologic mapping as a major component. I submitted a project and was fortunate to be selected as a member of this program. The experience would completely change my outlook on my education, skills and abilities.

The project that I submitted required that I spend the summer making a geologic map of the three quadrangles that cover Beaver Island, Michigan. Mapping on the Island was unlike anything that I encountered during field camp. The island is largely undeveloped, infested with biting insects, totally vegetated and ¾ of its area is made up of swamp, marsh and bog. In addition, instead of being composed of relatively simple to see bedrock, its location in the middle of Lake Michigan has exposed it to numerous glacial periods and multiple high water stages that have completely transformed the island and vastly increased the difficulty of the mapping process.

The project also has given the opportunity to experience the entire map making process from preliminary research to sample analysis and digitization. The map still includes 1:24000 mapping, cross sections, and unit descriptions just like in prior field camp experience, but mapping with real-world application and possible publication by the USGS requires much more. Before physically seeing the island, a study of previous work that had been completed on the island, of the island’s evolution, and an evaluation of the map components needed to best serve the area were completed. Field mapping was complicated by the fact that there were no outcrops to observe. Sample pits had to be dug in order to get to pure samples of the units being mapped. Also, instead of basing the map only on field observations, hundreds of samples were collected for later analysis during the post-mapping stage, allowing for much more accurate map descriptions and interpretations than those produced at a field camp.

Completion of the first two stages of my mapping has left me with a very different outlook. I have found that the impressions of geologic mapping that I had previous to this project have been almost totally revised. I feel that I am more competent with my skills, have a greater understanding of what goes into real-world mapping, and am much more confident in my abilities. My ability to think and act individually on a project has been amplified. In my mind, I am prepared to enter the work place or graduate school as a Geologist, instead of as a student who studied a lot about geology.

When compared to the experience of working individually on a professional-level project, field camp is minor. Field camp is still necessary in order to provide a solid foundation for further work, but it should not be the high point of a geology student’s education. The importance of the confidence and competence that can be developed by doing individual research or through an internship can not be overstated. Students are strongly encouraged to seek out opportunities beyond field camp. Nothing taught in college or university classes can prepare you to move on to be a successful geologist the way experience can. On the same note, educators, professionals, and businesses alike are even more strongly encouraged to offer these opportunities for students to take advantage of. As far as increasing students’ value in the workplace or their opportunity for success, you will be helping them more than simply offering a scholarship ever would.
The American Institute of Professional Geologists
Kentucky Section

42nd ANNUAL MEETING
LEXINGTON, KENTUCKY
OCTOBER 9-14, 2005

CALL FOR PAPERS

You are cordially invited to attend the 42nd Annual Meeting of the American Institute of Professional Geologists hosted by the Kentucky Section of AIPG in Lexington, Kentucky, October 9-14, 2005. The theme of this year’s meeting is “Geologic Information: Racing into the Digital Age.”

The Commonwealth of Kentucky has long been a leader in the publication of geologic maps and posting of online geologic data. In 1978, under a cooperative geologic mapping project involving the U.S. Geological Survey and the Kentucky Geological Survey, Kentucky became the first state in the Union to be completely mapped for all 707 quadrangles (1:24,000 scale, 7.5 minute). In 2002, Kentucky became the first state to have all of its open-file oil and gas geophysical logs and driller’s logs available online. In 2004, the Kentucky Geological Survey converted into digital format 707 printed geologic quadrangle maps for the state. From the far-reaching results and benefits of Kentucky’s geologic maps, the visitors to the 2005 Annual Meeting of AIPG will find the content of the technical sessions targeted to innovative techniques in mapping and computer applications, thus the theme “Geologic Information: Racing into the Digital Age.”

This year’s meeting not only incorporates our goal of highlighting geological mapping and computer applications, but also offers a forum to provide opportunities for reporting on regional geologic studies pertaining to a variety of topics. Such topics include energy and mineral resources, stratigraphy, sedimentology, paleontology, structural geology, basin analysis, and geophysics of the Appalachian Basin, Illinois Basin, Mississippi Embayment, Cincinnati Arch, and Nashville Dome. Kentucky and adjacent states are world famous laboratories for karst and groundwater systems. The region’s prominence in the study and application of environmental and engineering geology are also notable. In addition, there will be a forum for AIPG’s core issues concerning ethics, public policy, licensure, and legislation. The Technical Program Committee encourages you to participate in this informative meeting by contributing a written abstract for an oral or poster presentation. All papers related to the meeting theme or to the proposed theme sessions outlined below will be considered.

Proposed Theme Sessions:

- Geology, Geographic Information Systems (GIS), and the Internet
- Geologic Mapping, Remote Sensing, and Computer Applications
- Environmental and Engineering Geology
- Energy and Mineral Resources
- Karst and Groundwater Systems
- Stratigraphy, Sedimentology, and Paleontology
- Structural Geology, Basin Analysis, and Geophysics
- Ethics, Public Policy, and the Geologic Profession
- Geologic Outreach, Education, and Communication
- Licensure and Legislation

For Abstract Format and Instructions please see the following page.
2005 Annual Meeting
ABSTRACT FORMAT AND INSTRUCTIONS:

The format described below must be used to submit your abstract. Your abstract will be published in the Annual Meeting proceedings exactly as it is submitted, so please read and follow these instructions. All information submitted should be typed in Arial or Times Roman font, 12 point size, on an 8 ½ x 11 inch paper, using portrait orientation. Page margins should be 1-inch at the top, bottom, left, and right.

1. TITLE: The first item you should list is the title of your abstract. Titles should be in bold upper and lower case text, aligned with the left margin, beginning on the first line below the top margin. Example title:

The Integration of Kentucky’s Geologic Quadrangle Maps with Coal Resource Data

2. AUTHORS: After the title, skip one line and type the senior author’s name (last name first), followed by additional authors (see example below). CAPITALIZE the name of each author. In upper and lower case text following the author’s name(s) include the author’s affiliation, city, and state/province. If the speaker will not be the senior author, put an asterisk (*) after the speaker’s name. Example authors:

Lumm, Donald K., Kentucky Department of Revenue, Frankfort, KY, John T. Popp, Alliance Coal Company, LLC, Lexington, KY

3. ABSTRACT: Skip another line and begin the body of your abstract. Abstracts for both oral and poster presentations are limited to 250 words or less; abbreviations (except for units of measurement) are not permitted. Use the full width of the page (within page margins); indent the first line of each paragraph by ¼ inch. Lines must be single-spaced. Justify the type to the left and right margins. Illustrations, graphs, and references are permitted. PLEASE PROOFREAD your abstract; no corrections will be made after your abstract is submitted.

4. SUBMITTAL: You may either submit your abstract on a 3 ½-inch floppy or compact disc and mail to Donald K. Lumm, or you may e-mail the document on an attached Word file to Donald K. Lumm. In addition, please copy, complete and submit the abstract submittal form at the bottom of this page.

The Deadline for Submitting an Abstract is April 30, 2005.

Mail Abstract and Abstract Form to:
Dr. Donald K. Lumm, Technical Program Chair
Kentucky Section, AIPG
P.O. Box 24690
Lexington, KY 40524-4690

OR
Email Abstract and Abstract Form to:
Dr. Donald K. Lumm, Technical Program Chair
DonnieLumm@aol.com

ABSTRACT FORM

Speaker’s name: ________________________________________________________________
Affiliation (employer): __________________________________________________________
Office Phone: ________________Office FAX: ________________Email: _____________________
Address: _____________________________________________________________________
City, State, ZIP/Postal Code: ____________________________________________
For: Oral _____ Poster _____ Either _____ Are you a student? ______
Please indicate preferred session: 1) ________________________________ 2) ________________________________
Mode of Presentation: 35 mm slides (projector______) overhead proj.______ PowerPoint (single screen) ______
NOW AVAILABLE!

AIPG History Book

How did AIPG really get started?

What roles did the well-established AAPG and AGI play in the formation of the first Professional (not scientific) geological society?

Who were the “Magnificent Seven” who founded AIPG in 1962-63?*

We were APGS in 1975-79 why did we change our name, and what does APGS stand for?

The answers to these and other questions make interesting reading to the curious as to the formation and progress of AIPG. After years of accumulating information, past-President Richard Proctor has finished the book, titled “A History of AIPG 1963-2003”; includes many photographs, a Who’s Who/Who Was Who in AIPG, and more than 70 selected speeches and papers by CPGs.

This 390 page book is available in hard cloth cover - $80.00, soft cover - $45.00, CD - $15.00 (include $4.00 for shipping and handling for CD and $10 for either book), or free online in pdf format.

(*The magnificent Seven who founded AIPG, by correspondence prior to the Organizational Meeting in September 1963, were Edward “Bud” Rue of Illinois, Frank Conselman of Texas, William Mallory of Colorado, Allen Tester of Iowa, Ad Honkala of Virginia, Robert Becker of Oklahoma, and Ben Parker of Colorado).
Colorado Section

5th Biennial AIPG Colorado Front Range Geoscience Career Day

The 5th Biennial Colorado Section Student Day was held Saturday, September 11, 2004 on the campus of the Colorado School of Mines (CSM). The purpose of this event was to provide students with insights into the various subdisciplines of the geosciences, to network with practicing geologists in these areas, and to consider issues of professional practice and career development.

Logan MacMillan, 2003-2004 Colorado Section President, organized the “technical” program and Dawn Schippe CSM AIPG Student Chapter President, and Graham Closs Chapter Faculty Sponsor handled logistics at CSM. As with past Student Day events, the morning consisted of presentations by professionals in various branches of geology and the afternoon was devoted to a field trip to locations along the Front Range near Golden. Ten students, representing CSM, University of Northern Colorado, Colorado College, and the University of Colorado-Boulder, and 12 professional geologists were in attendance. The format was informal, encouraging questions from the audience. Opportunities for individual conversations with speakers and networking were provided at breaks and over lunch.

Bill Siok, AIPG Executive Director, started the program off by describing the role of AIPG and its relationship to the technical professional organizations in the careers of geoscientists. The issue of licensing of geoscientists, now required in over 30 states, was also addressed.

Steve Sonnenberg provided an overview of the petroleum industry, the opportunities for new graduates, and the skills required to succeed. He also pointed out a reality, to be echoed by many of the other speakers, that the industry is graying and thus many more opportunities will be opening in the near future.

Dave Holmes tackled the Economic Geology-Hard Rock Mining and Industrial Minerals sector. His career has included work experience in both these areas. Interesting, his central message was a love of geology, an appreciation of fundamentals, and a lifelong curiosity and interest in learning. Solid advice for us all.

Rocky Thompson shared his experience in the coal industry. Positions in mine site operations require a blend of fundamental geology and geotechnical engineering skills. Continuing education, both formal and informal, is a necessity. Working in cross-functional teams is standard.

Engineering geology was addressed by Dave Glater (Consultant) and Dave Noe (Colorado Geological Survey). Again, integration of basic geology and engineering was emphasized. Experience gained from field projects is essential to professional growth. Contact with both regulatory authorities and the general public requires development of solid communication skills.

Suzanne Paschke, currently a Research Hydrologist with the USGS (Denver), discussed the principles of ground-water hydrology, the nature of her work as a research scientist, and the skills needed for a career in this branch of science.
of the geosciences. In addition to the traditional academic courses, the following additional skills were recommended – computer modeling, GIS, field experience, financial and management experience, and writing!!!

Matt Sares (Colorado Geological Survey) and Karen Berry (Jefferson Conservation District/Colorado Geological Survey) addressed “environmental” geology. Matt described activities of the CGS in hazards identification and mitigation while Karen provided a broader perspective, outlining the contribution of geological information to solution of dual scientific and societal problems at the community level.

Dave Abbott (Consulting Geologist) concluded the morning session with a practical discussion of ethics as a foundation of appropriate professional practice. Honesty, honesty, honesty!!!

Each speaker provided both personal and professional insights into his or her current area of geology. Many had experience in a variety of facets of geology – speaking to a sound appreciation of the basics and personal flexibility to take advantage of opportunities as they arise. There were many common themes presented by the speakers. Steve Sonnenberg’s list of suggestions for students captures these themes; (1) life long learning, (2) goal setting, (3) attitude, (4) pride in your work, (5) believe in yourself, (6) high ethics, (7) learn teamwork skills, (8) build your network, (9) learn leadership skills, and (10) enjoy what you do. Thanks Steve!

After lunch Dave Noe and Dave Abbott led a group of students (and hang- ers-on Logan MacMillan and Graham Closs) to several key sites around Golden. The diversity of these sites for both geologists and the general public is considerable! The first stop north of Golden provided an excellent vantage of the southwest corner of North Table Mountain. The contrast between the potential geotechnical hazards identified by the USGS in the 1960s and the recent housing development provided a lead-in to discussion of competing scientific and development issues in public policy formulation. The second stop was at Red Rocks Park. It provided an opportunity to discuss fundamental geological principles of structure and stratigraphy while simply being awed by the natural beauty of the setting. The last stop was the Highway 285 road-cut through the Hogback. There was something for both petroleum and mineral resource geologists. The Turkey Creek oil seep is exposed on the north side of the highway whereas a roll front uranium occurrence is visible on the south side of the highway. What diversity in just three stops.

We now look ahead to the 6th Biennial Student Day in 2006. Our goal remains the same – to provide students with insights into the science and practice of geology and to share our love of the profession with them. (Contact: ldoss@mines.edu).

L. Graham Closs, CPG-07288, Department of Geology and Geological Engineering, Colorado School of Mines

Kentucky Section

KSPG / KY-AIPG JOINT FALL 2004 FIELD TRIP

The Kentucky Society of Professional Geologists (KSPG) and the Kentucky Section of AIPG (KY-AIPG) sponsored a joint field trip October 22–23, 2004. The trip visited the Big Hill roadcut on Ky. 421 in Madison County and the nearby Clover Bottom underground limestone mine on October 22. On October 23, a farm in Estill County was visited, where attendees were able to collect geodes and Kentucky agates, while experiencing rural farm life. Approximately 75 people attended the field trip, including geologists, people from throughout Kentucky interested in geology, as well as a large number of graduate and undergraduate geology students from Eastern Kentucky University, Morehead State University, and the University of Kentucky.

The Big Hill portion of the field trip was led by Tom Lierman, a professor at Eastern Kentucky University, Charles Mason (CPG-7465), a professor at Morehead State University, Frank Ettensohn, a professor at the University of Kentucky, William Andrews, of the Kentucky Geological Survey, and Doug Smith, a retired geologist from the Kentucky Department of Transportation. The Clover Bottom Mine portion of the trip was led by David Reilly and Adam Holt of The Allen Company, Inc., owner/operator of the mine. The geode and agate-hunting trip was led by Patrick Gooding of the Kentucky Geological Survey.

The Big Hill roadcut is on part of the Pottsville Escarpment, and provides a fresh, nearly continuous, easily accessible exposure of the Middle and Upper Mississippian sections. Along a short distance of highway the relationship between lithology and physiography is revealed. Many features can be used to interpret depositional environments, paleoecology, potential for hydrocarbon reserves, and karst hydrology. Mississippian strata exposed in the roadcut include the New Albany Shale, Jacobs Chapel Bed, and Rockford Limestone (Kinderhookian); Borden Formation (Osagian); and Slade and Paragon Formations (Meramecian/Chesterian). The Nancy, Cowbell, and Nada Members of the Borden Formation are primarily siltstones and shales that represent proximal delta facies of the Borden Delta Complex. The Nancy Member of the Borden contains many siderite nodules. Typical nodules at the site have an internal core made up of fossils such as brachiopods, mollusks, and coiled nautiloids. Some are hollow and often contain a drusy lining of crystals, while others are septaric. The Slade Formation is primarily composed of carbonates that show a transition from a deltaic sequence to a carbonate ramp depositional environment. The Paragon Formation is largely composed of shallow-water, marginal-marine clastics. Typical Mississippian fossils, such as partial crinoid calyces, brachiopods, blastoids, and gastropods, can also be found.

Landsliding of the shales of the Borden Formation during construction of the Big Hill roadcut required innovative engineering solutions. The various methods used to control slope failure including the use of horizontal drains and placement of rip-rap were discussed by Doug Smith.

At Clover Bottom, an active underground limestone mine in the Tygart Creek Member of the Slade Formation was visited. This mine has operated since approximately 1951 and occupies 100 acres, of which 60 acres is the underground mining operation. Crushed stone from the Clover Bottom Mine has a variety of uses, primarily for road and building construction, local governments, concrete plants, asphalt plants, and utility contractors. During the field trip, attendees observed active mining operations, pre-blast drilling, and loading and crushing/grading operations. Outside the mine, attendees found a cave that some explored; others stumbled onto a “bone bed,” which was abundant with fish scales, teeth of a shark that ate shellfish, and bryozoan (Archimedes) fossils.
On October 22, a picnic lunch was provided for field trip attendees at a house owned by Berea College, built on one of the high points overlooking the Knobs and Outer Bluegrass physiographic regions. With fall colors at a peak, and a view of Bighill Mountain and the surrounding Knobs, it was an enjoyable lunch. That evening a catered dinner was provided inside a log cabin meeting facility in the town of Berea, and a local bluegrass band provided entertainment.

The October 23 lunch included a cookout at a farm owned by Patrick Gooding's wife's family. The Bicknell farm has been in the family for over one hundred years, and has not yet been updated to provide indoor plumbing. Geodes and Kentucky agates were abundant in the streams on the farm property. Mule-drawn wagon rides, as well as horseback rides, were provided for the attendees. Even though this was supposed to be only a half-day event, the field trip did not break up till 4 p.m.

This was the first joint field trip sponsored by KSPG and KY-AIPG. KSPG has historically held its own annual field trip in conjunction with its annual banquet and meeting in the fall. KY-AIPG normally holds annual field trips in the spring along with an awards banquet. Based on the number of attendees and the good times had by all who attended, we hope that this will be the first of future joint efforts between the two Kentucky geological organizations. Several attendees committed to completing CPG applications and blue membership cards. As one of the sponsors for the 42nd annual AIPG meeting to be held in Lexington, Kentucky, October 10-16, 2005, KSPG and its members are expected to provide valuable assistance in making the 2005 AIPG meeting a success.

Gil W. Cumbee, CPG-9436, Vice-President, AIPG KY Section
Richard A. Smath, MEM-0240, President, KSPG

SECTION NEWS

Virginias Section

Proposal to Implement an Environmental Geoscience Area of Emphasis with Marshall University’s existing B.S. Geology Program

The American Geologic Institute Report on the Geosciences (2002) indicates that 30% of the 125,000 geoscientists currently employed in the U.S. are environmental geoscientists. This represents 37,500 geoscientists. This number is expected to increase 21-35% by 2010. This will produce 7,875-13,125 new openings in addition to those created by retirements. Environmental geoscientists will be needed to solve problems with pollution, waste disposal, and urban development, and geologic hazards such as flooding and erosion.

In the last 3 years we [Marshall University] have had more requests for graduates to fill environmental geoscience openings than we have had graduates to fill them. Environmental and engineering companies have employed the majority of geology majors who have graduated over the last 6 years. Many environmental companies are located in the Charleston-Huntington area (Triad, H.C. Nutting, Ackenheil, Rucker, American Geotech, Inc., WVDEP). Other potential employers include Federal agencies (U. S. Geological Survey, U. S. Army Corps of Engineers), and State agencies charged with permitting and environmental protection particularly in the areas of mining and waste disposal.

There has been an increased demand for graduates with specialization in the areas that the proposed curriculum would provide. The above employers and similar companies throughout the region would be better served by graduates who have completed the environmental geoscience area of emphasis. Despite the recent proliferation of environmental studies programs here at Marshall and elsewhere, employers at environmental and geotechnical companies still prefer graduates with geology degrees because they have a better understanding of the processes that operate below the earth’s surface and how these interact with surface processes. They have a more solid background in science and in field based, problem solving situations.

Recommendations published by the U.S. Dept of Labor indicate a geology degree as the best suited education for environmental scientists.

From Department of Labor Webpage

Employment of environmental scientists and hydrologists is expected to grow faster than the average for all occupations through 2010, while employment of geoscientists is expected to grow about as fast as the average. The need to replace environmental scientists and geoscientists who retire will result in many job openings over the next decade. Driving the growth of environmental scientists and geoscientists will be the continuing need for companies and organizations to comply with environmental laws and regulations, particularly those regarding groundwater contamination and flood control. However, oil company mergers and stagnant or declining government funding for research may affect the hiring of petroleum geologists and geoscientists involved in research. Instead, increased construction and exploration for oil and natural gas abroad may require geoscientists to work overseas unless additional sites in the United States are opened for exploration.

In the past, employment of geologists and some other geoscientists has been cyclical and largely affected by the price of oil and gas. When prices were low, oil and gas producers curtailed exploration activities and laid off geologists. When prices were up, companies had the funds and incentive to renew exploration efforts and hire geoscientists in large numbers. In recent years, a growing worldwide demand for oil and gas and new exploration and recovery techniques—particularly in deep water and previously inaccessible sites—have returned some stability to the petroleum industry, with a few companies increasing their hiring of geoscientists. Growth in this area, though, will be limited due to increasing efficiencies in finding oil and gas. Geoscientists who speak a foreign language and who are willing to work abroad should enjoy the best opportunities.

The need for companies to comply with environmental laws and regulations is expected to contribute to the demand for environmental scientists and some geoscientists, especially hydrologists and engineering geologists. Issues of water conservation, deteriorating coastal environments, and rising sea levels also will stimulate employment growth of these workers. As the population increases and moves to more environmentally sensitive locations, environmental scientists and hydrologists will be needed to assess building sites for potential geologic hazards and to address issues of pollution control and waste disposal. Hydrologists and environmental scientists also will be needed to conduct research on hazardous waste sites to determine the impact of hazardous pollutants on soil and groundwater so engineers can design remediation systems. The need for environmental scientists and geoscientists who understand both the science and engineering aspects of waste remediation is growing. An expected increase in highway building and other infrastructure projects will be an additional source of jobs for engineering geologists.

Employment of environmental scientists and geoscientists is more sensitive to changes in governmental energy or environmental policy than employment of other scientists. If environmental regulations are rescinded or loosened, job opportunities will shrink. On the other hand, increased exploration for energy sources will result in improved job opportunities for geoscientists.

AIPG Section Websites

AIPG Section Website links are on the AIPG National Website at www.aipg.org. Click on the top right drop down menu and click on Section Websites.

If your section does not have a website contact AIPG Headquarters to get one setup (wjd@aipg.org).
NEW APPLICANTS AND MEMBERS (09/03/04 - 12/03/04)

Applicants for certification must meet AIPG’s standards as set forth in its Bylaws on education, experience, competence, and personal integrity. If any Member, or Adjunct, has any factual information as to any applicant’s qualifications in regard to these standards, whether that information might be positive or negative, please mail that information to Debra Tsurikawa, AIPG, at the address below.

This information will be circulated only so far as necessary to process and make decisions on the applications. Negative information regarding an applicant’s qualifications must be specific and supportable. Persons who provide information that leads to an applicant’s rejection may be called as a witness in any resulting appeal action.

**Applicants for Certified Professional Geologist**

**AK-Paul Andrews**
POB 671154, Chugiak, AK 99567

**NV-Weiquan Dong**
1600 E. University Ave., Apt. 220, Las Vegas, NV 89119

**OH-Patrick W Duncan**
RP Consultants Inc., 8500 Station St., Ste. 215, Mentor, OH 44060

**AK-Brian R Ranian**
PO. Box 84830, Fairbanks, AK 99708

**NJ-Daniel J. Goetz**
2032 Baswood Ct., Toms River, NJ 08755

**NY-Caron S. Koll**
2469 W. 2nd Drive, Lakewood, CO 80228

**WA-Michael J. Hopley**
799 Windridge Cir., San Marcos, CA 92078

**New Members**

**TX-Txue L. Bishop**
1002 Carroll Lane, PO. Box 486, Grandview, TX 76050

**NY-Brian R Goodwin**
Conrad Geoscience Corp., 8 Raymond Avenue, Poughkeepsie, NY 12603

**MA-Bradford A. Miller**
210 N. Florida St., LA 90018-1407

**CA-Russell B. Pace, III**
2032 Basswood Ct., Toms River, NJ 08755

**WV-Brad A. Woodard**
999 Windridge Cir., San Marcos, CA 92087

**Applicant Upgrading to CPG**

**CA-Demetrius C. Pohl**
Carlson Pohl Associates, 2179 West 20th St., Los Angeles, CA 90018-1407

**CHILE-George A. Schoer**
Cerro De La Cruz, 10450 Lo Barnechea, Santiago, CHILE

**NY-Carla M. Sullivan**
Laurel Envr. Associates, Ltd., 52 Elm St., Huntington, NY 11743

**CO-Charles H. Thomas**
1246 W. 2nd Drive, Lakewood, CO 80228

**Applicant Upgrading to CPG**

**NV-Scott G. Kuntzelman**
RR #1 Box 32, Carlock, IL 61725

**IL-Melinda D. Hilbe**
1412 Western Dr., Bloomington, IL 61704

**OH-Andrea M. McIntire**
A.G. Wassenaar, Inc., 2180 S. Ivanhoe Street Ste. 5, Denver, CO 80222

**WA-Emily W Brennan**
13026 96th Place NE, Kirkland, WA 98034

**NM-Rene G. Von Boeck**
2032 Basswood Ct., Toms River, NJ 08755

**CA-Steven L. Park**
420 S. Marion Pkwy #1202, Denver, CO 80209

**FL-Tamara J. Olivier**
2032 Basswood Ct., Toms River, NJ 08755

**New Certified Professional Geologists**

**NM-Robin S. White**
163 Placitas Trails Rd., Placitas, NM 87043-9422

**CO-Brad A. Wodward**
A.G. Wassenaar, Inc., 2180 S. Ivanhoe Street Ste. 5, Denver, CO 80222

**WA-Emily W Brennan**
13026 96th Place NE, Kirkland, WA 98034

**NY-Rene G. Von Boeck**
1961 Moonshadow Dr., Reno, NV 89523

**CA-Steven L. Park**
420 S. Marion Pkwy #1202, Denver, CO 80209

**CA-John L. Rietman**
CA-10850

**New Applicants and Members (09/03/04 - 12/03/04)**

**OH-Andrea M. McIntire**
SA-0226

**OK-Juliana N. Gendron**
SA-0494

**NY-Michael J. Hopley**
SA-0707

**AK-Paul Andrews**
SA-0707

**NV-Weiquan Dong**
SA-0707

**OH-Patrick W Duncan**
SA-0707

**AK-Brian R Ranian**
SA-0707

**NJ-Daniel J. Goetz**
SA-0707

**NY-Caron S. Koll**
SA-0707

**MI-Jason J. Lagowski**
SA-0707

**NY-Scott G. Kuntzelman**
SA-0707

**CA-Russell B. Pace, III**
SA-0707

**WV-Brad A. Woodard**
SA-0707

**IL-Melinda D. Hilbe**
SA-0707

**OH-Andrea M. McIntire**
SA-0707

**New Student Adjuncts**

**OH-Andrew H. Mihale**
CAR-0722

**TX-Julia A. Kahmann**
SA-0722

**CA-5722**

**NM-Robin S. White**
SA-0722

**FL-Tamara J. Olivier**
SA-0722

**CA-Gary A. Parker**
SA-0722

**New Student Adjuncts**

**OH-Andrew H. Mihale**
CAR-0722

**TX-Julia A. Kahmann**
SA-0722

**CA-Gary A. Parker**
SA-0722

**New Student Adjuncts**

**OH-Andrew H. Mihale**
CAR-0722

**TX-Julia A. Kahmann**
SA-0722

**CA-Gary A. Parker**
SA-0722
## NEW APPLICANTS AND MEMBERS (05/28/04 - 07/13/04)

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<thead>
<tr>
<th>State</th>
<th>Name</th>
<th>Address</th>
</tr>
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<tbody>
<tr>
<td>RI</td>
<td>Bryan A. Oakley</td>
<td>1525 Grandview Ave. #1, Papillon, NE 68046</td>
</tr>
<tr>
<td>TX</td>
<td>Victor H. Galvan</td>
<td>500 West University Ave., El Paso, TX 79968</td>
</tr>
<tr>
<td>OH</td>
<td>Jennifer M. Wothers</td>
<td>3607 Shaker Rd., Franklin, OH 45005</td>
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<tr>
<td>LA</td>
<td>Rebecca L. Totten</td>
<td>71295 St. Charles St., Abita Springs, LA 70420</td>
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<tr>
<td>CA</td>
<td>Daniel A. Zuck</td>
<td>486 Hartwick Drive, Oneonta, NY 13820</td>
</tr>
<tr>
<td>MO</td>
<td>Scott W. Lepley</td>
<td>101 Geological Sciences, Columbia, MO 65211</td>
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<tr>
<td>MO</td>
<td>Carolina Asaza</td>
<td>78 Summer St. Apt. 3L, Somerville, MA 02143</td>
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<tr>
<td>KS</td>
<td>Katrina E. Pekar</td>
<td>108 Thompson Hall, Manhattan, KS 66506</td>
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<tr>
<td>KS</td>
<td>Melissa Ingrisano</td>
<td>1607 B Poyntz Ave., Kansas City, MO 66502</td>
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<tr>
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<td>Samantha J. Harris</td>
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<tr>
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<tr>
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<td>610 N. 1100 W., Provo, UT 84601</td>
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<tr>
<td>NY</td>
<td>Rachel Betrus</td>
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</table>
NEW APPLICANTS AND MEMBERS (05/28/04 - 07/13/04)

NC - Jason D. Jarvis  SA-0604
245 Memorial Drive, Suite 7224, Cullowhee, NC 28723

ID - Katherine L. Rhode  SA-0605
1330 S. Main St. #11, Moscow, ID 83843

MI - Merideth A. Lindeman  SA-0606
206 Natural Science Building, East Lansing, MI 48824

WI - Jerod R. Randall  SA-0607
700 College St. Box 865, Beloit, WI 53511

PA - Elizabeth A. Diesel  SA-0608
1700 Moore St., Huntingdon, PA 16652

MO - Daniel R. Lasco  SA-0609
2207 Vichy Rd. Apt. K, Rolla, MO 65401

CA - Ashlee L. Dere  SA-0610
1131 A Walnut St., San Luis Obispo, CA 93401

IN - Paul C. Inkenbrandy  SA-0611
818 S. Barker Ave. Apt. C, Evansville, IN 47712

SC - Emily L. Batts  SA-0612
2494 Etiwan Ave. Apt. C3, Charleston, SC 29414

LA - Caleb S. Fontenot  SA-0613
401 Anderson, Apt. 13K, College Station, TX 77840

IN - Adam J. Hankins  SA-0614
226 N. 9th, Decatur, IN 46733

IN - Jennifer E. Earles  SA-0615
352 B S. Rosenberger Ave., Evansville, IN 47712

IN - Amy M. Kelley  SA-0616
331 Adams St., Newburgh, IN 47630

MI - Rachael A. Czechowskyj  SA-0617
10344 64th Ave., Allendale, MI 49401

KY - Amanda M. Mullen  SA-0618
515 Regents A, Bowling Green, KY 42101

OH - Eduardo F. Guemser  SA-0619
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0620
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0621
PO. Box 503, Loma Linda, CA 92354

TX - Austin K. Baldwin  SA-0622
450 Duval St. #180, Austin, TX 78751

NV - Brien K. Park  SA-0623
4505 South Maryland Parkway, Las Vegas, NV 89119

OR - Isaac J. Smith  SA-0624
2250 Patterson St., #68, Eugene, OR 97405

OH - Eduardo F. Guemser  SA-0625
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0626
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0627
PO. Box 503, Loma Linda, CA 92354

TX - Austin K. Baldwin  SA-0628
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NV - Brien K. Park  SA-0629
4505 South Maryland Parkway, Las Vegas, NV 89119

OR - Isaac J. Smith  SA-0630
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OH - Eduardo F. Guemser  SA-0631
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0632
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0633
PO. Box 503, Loma Linda, CA 92354

TX - Austin K. Baldwin  SA-0634
450 Duval St. #180, Austin, TX 78751

NV - Brien K. Park  SA-0635
4505 South Maryland Parkway, Las Vegas, NV 89119

OR - Isaac J. Smith  SA-0636
2250 Patterson St., #68, Eugene, OR 97405

OH - Eduardo F. Guemser  SA-0637
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0638
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0639
PO. Box 503, Loma Linda, CA 92354

TX - Austin K. Baldwin  SA-0640
450 Duval St. #180, Austin, TX 78751

NV - Brien K. Park  SA-0641
4505 South Maryland Parkway, Las Vegas, NV 89119

OR - Isaac J. Smith  SA-0642
2250 Patterson St., #68, Eugene, OR 97405

OH - Eduardo F. Guemser  SA-0643
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0644
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0645
PO. Box 503, Loma Linda, CA 92354

TX - Austin K. Baldwin  SA-0646
450 Duval St. #180, Austin, TX 78751

NV - Brien K. Park  SA-0647
4505 South Maryland Parkway, Las Vegas, NV 89119

OR - Isaac J. Smith  SA-0648
2250 Patterson St., #68, Eugene, OR 97405

OH - Eduardo F. Guemser  SA-0649
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0650
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0651
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TX - Austin K. Baldwin  SA-0652
450 Duval St. #180, Austin, TX 78751

NV - Brien K. Park  SA-0653
4505 South Maryland Parkway, Las Vegas, NV 89119

OR - Isaac J. Smith  SA-0654
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OH - Eduardo F. Guemser  SA-0655
1216 Slayter Hall, Granville, OH 43023

AZ - Kathleen A. McFadden  SA-0656
13001 N. 51st Dr., Glendale, AZ 85304

CA - Matthew S. Mayry  SA-0657
PO. Box 503, Loma Linda, CA 92354

TX - Austin K. Baldwin  SA-0658
450 Duval St. #180, Austin, TX 78751

NV - Brien K. Park  SA-0659
4505 South Maryland Parkway, Las Vegas, NV 89119

New Corporate Member

TX - Geoscience Data Management, Inc.
CM-1003
P.O. Box 864424, Plano, TX 75086

AIPG Membership Totals

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<td>CPG - Retired</td>
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<td><strong>TOTALS</strong></td>
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AIPG Signs-Up 142 New Students at the GSA Annual Meeting in Denver, Colorado November 7 - 10, 2004

Thank you to the AIPG Members who sponsored students for this event:

Robert Carvalho - EAI, Inc.
Robert Font - Geo Science Data Management, Inc.
Susan Landon - Independent
Rick Obernolte - O&G Envr. Consulting, LLC
Rick Powers - BCI Engineers & Scientists, Inc.
David Rhode - Smith Barney
Bill Siok - AIPG
Russ Slayback - Leggette, Brash & Graham, Inc.
IN MEMORY

Michel T. Halbouty, CPG-00010

Michel T. Halbouty, CPG-00010, a Charter Emeritus Member of AIPG, was on the AIPG National Executive Committee in 1966. He received AIPG's most prestigious award the Ben H. Parker Memorial Medal in 1988 and was awarded Honorary Membership in 2002. Mr. Halbouty was also a long standing member of AAPG.

Michel Halbouty, 95: Oilman Was Friend of Two Presidents

Michel Halbouty, a legendary Texas wildcatter and independent oil and gas man who was friend of two Republican presidents, has died. He was 95.

Halbouty died November 6 at a hospital in Houston. He had been battling cancer.

Known as Mike, Halbouty influenced George H.W. Bush to locate his presidential library at Texas A&M, and he was an advisor on Ronald Reagan's energy task force in Reagan's first presidential campaign.

Halbouty is "one of the tallest Texans of our time," Richard J.V. Johnson, chairman and publisher of the Houston Chronicle, said in presenting Halbouty with a leadership award in 2000.

A native of Beaumont, Texas, whose parents were Lebanese immigrants, Halbouty as a teenager carried water to workers in the oil fields of Spindletop, the famed oil field near Beaumont that launched the Texas oil industry in the early 1900s. He earned his bachelor's and master's degrees from Texas A&M and discovered his first big oil field shortly after leaving school.

He served in the Army during World War II as a lieutenant colonel, heading production for the Army-Navy petroleum section. After the war, he continued wildcatering, going broke a couple of times but making millions in between. At one point, he said, his company had 60,000 rigs.

The outspoken Halbouty was an ardent defender of the oft-maligned oil industry.

"The oil industry gave us our strong standard of living because of the assets and the money [that] flowed into this country," he told the Houston Chronicle in 1996.

He was once quoted as saying that the oil business was not the pessimist, "or even the realist."

"You've got to be an optimist," he said. "You've got to believe no matter how many dry holes you drill, the next one is going to hit."

He is survived by his wife, Billye; a daughter, a son and seven grandchildren.

Los Angeles Times, November 18, 2004
From a Times Staff Writer

Answers to Questions on Page 17

1. The answer is choice (a), or "yes."

The so-called "oil window" or "petroleum kitchen" occurs at temperatures ranging from 150° to 450° F. Oil tends to form at temperatures ranging from 300° to 350° F. Dry gas forms at temperatures ranging from 300° to 450° F. At higher temperatures, hydrocarbons are "cooked."

In general, algal-derived kerogen yields oil when mature and gas when over mature. Woody kerogen tends to yield gas directly upon maturation.

More specifically, "Type I" organic matter with high hydrogen and low oxygen content, such as that related to fresh water algae and lacustrine environments, yields waxy oil during maturation. "Type II" organic matter with intermediate hydrogen and oxygen content, such as that related to marine algae and plankton, yields low-wax oil during maturation. Finally, "Type III" organic matter with low hydrogen and high oxygen content, such as that related to land plants and paludal environments, yields gas upon maturation.

2. The answer is choice (a) where i = Ø. The proof follows:

Consider an infinite slope (where the slope angle is "i") in a cohesionless sand. Consider a wedge of height "d" and width "a" as shown above. The weight of the wedge is represented by vector "W". Vector "W" is the resultant of two components, a normal vector "N" acting perpendicular to the base of the wedge and a shear vector "T" acting parallel to the base of the wedge. Geometrically, the angle between vectors "W" and "N" is the slope angle "i". The weight of the wedge can be approximating by multiplying its width times its height times the unit weight of the sand "γ"; thus, W = adγ.

Now, the normal stress "σn" and the shear stress "τ" act along the base of the wedge (a/cos i). Thus,

σn = N / (a/cos i)
τ = T / (a/cos i)
σn = adγ cos i
τ = ady sin i / (a/cos i)
σn = σγ cos i
τ = adγ sin i / (a/cos i)
τ = (σn / cos i)(sin i cos i)
τ = σn tan i

In the above equation, we show that the shear stress is equal to the normal stress times the tangent of the slope angle. Now the equation of shear strength for earth materials, based on the Coulomb-Mohr fracture criterion is:

s = c + σn tan ϕ (for cohesive soils)

Since we have a sand with no cohesion, c = 0 and:

s = σn tan ϕ (for cohesionless soils)

When the shear stress "τ" becomes equal to the shear strength "s", then limit equilibrium (the condition of incipient failure) exists. Thus, in our example:

τ = σn tan i
s = τ = σn tan ϕ (at the failure point)

So, limit equilibrium occurs when i = ϕ since at that point τ = s.

This applies whether or not the sand is totally dry or completely submerged in water, as long as no seepage occurs.
This service is open to AIPG Members as well as non-members. The Professional Services Directory is a one year listing offering experience and expertise in all phases of geology. Prepayment required. Advertising rates are based on a 3 3/8” x 1 3/4” space.

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Trumbull, Connecticut
(203) 452-3300 www.lbgw.com

**Office Nationwide**
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**David M. Abbott, Jr.**

Consulting Geologist

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evaluating natural resources, disclosures about them, reserve estimates, and geological ethics & practices

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As a geologist who is now the Director of Environmental Services for Capital Crossing Bank in Boston, I would encourage all of our student members to not only complete hard science classes but also general business courses especially in commercial banking and real estate. These industries drive many of the transactions that require our expertise. By becoming knowledgeable of their future customer’s businesses, these young geologists will be able to converse in the language of business while solving their client’s science-based problems. All students should participate in internships both in laboratories and field sites as well as banks, construction or real estate companies that have earth science or environmental divisions. These experiences will help the student to understand that the science issues that they will work on are likely only a small part of the overall “deal” their bosses are pursuing. The students must remember that their future clients/bosses are not just interested in scientific solutions but also in finding people that understand how their expertise can help make the deal work or their businesses thrive.

I would be happy to speak to any of our student members looking for additional ideas or encouragement.

Michael Bell, CGP-10451

I have listed some areas students should focus on prior to graduation:

- Students in geology should start thinking about their career goal really early in their studies. If you become a professor of geology, mining geologist or an environmental geologist, they all require additional skills that may not be covered in the basic geology program. If you become an environmental geologist you would want to take some classes about environmental geology, remediation techniques, etc. Taking a few extra classes that are more focused in your career direction can make you more marketable. This may sound obvious, but it may not be obvious to everyone.
- Think about where (geographically) you are going to work. Start to study the geology in the area so you are prepared for interviews with at least a basic understanding of the geology that you would be working with.
- Get an intern position with a company that you are interested in working with. You get to see if the job and company are something you really like. If you do not, you still have time to change direction.
- After graduation, keep yourself refreshed in geological topics, studies, etc. Many states and organizations are moving to certification with exams and the longer you are out of school, the more you “forget”, especially if you do not use it on a regular basis.

Hope these thoughts help.

Cheryl L. Coffee, CGP-10772

I note three problem areas or deficiencies with respect to today’s students with whom I come in contact: 1. Inability to communicate; 2. Inability to perform field work; and 3. Over-reliance on the application of computer-based technologies to provide “the answer.” To save anyone from jumping to conclusions, yes, I am among the older geologists who learned much of the geology I know at the outcrop, so I likely have a bias. Also, depending on how “professional experience is defined, I am cruising up on forty years since receiving my Bachelor’s degree.

Inability to communicate, verbally and in writing, especially the latter, is the biggest concern. Too often I read reports written as though the student or recent graduate was talking to himself or herself. The science may be there, but if you did not already know what the person was trying to say, it would make little or no sense. Perhaps this is the sole emphasis in grading, but even good science is useless unless it can be communicated to others. Of course, this is not a new problem or deficiency with respect to today’s students, it just does not seem to be getting any better. Twenty-plus years ago I taught a course called “Geological Hazards.” Each test contained an essay question that required integration of concepts covered in class and in the text. Invariably, after the exam, students would ask me what the correct answer was. To their dismay, my response was “there wasn’t one. You will be graded on your analysis of the problem, your marshalling of facts, specification of assumptions, and presentation.” Some, perhaps many, felt that the essay question was unfair because they could not simply parrot back what had been presented in class and in the text, but the essay question is the reality of the practice of geology.

Too few of the universities and colleges with which I am familiar spend what to me is sufficient time in the field or include exercises that require field work. Perhaps this is because the professors are trying to cram so much information in too little time; perhaps this is because, relatively speaking, field work is expensive; perhaps it is because field work is so time-consuming, especially for the professors, or perhaps it is because of the liability incurred by assigning field work related projects. I see students who are mathematical geniuses, computer whizzes, and walking chemical encyclopedias, but could not measure strike and dip, take a water sample, organize a drilling program, describe core, or run a pumping test if their lives depended on it. Perhaps I am old-fashioned, but I still view geology as a science requiring physical, as well as mental, involvement.

The development of ever faster, more powerful desk and lap top computers, numerical models, user-friendly pre- and post-processor routines and the application of statistical filters have brought wonderful tools to the science of geology. But they are just that — tools, not answers. I cannot tell you how many times I have asked how or on what basis a young geologist knows something, only to be told “I modeled it.” When I can control myself and ask “What assumptions, explicit and implicit, necessary to the model or statistical analysis are consistent with the data and with the geologist’s understanding of the system? I am almost invariably greeted with a blank look. Application of the model or statistical program is considered not only necessary (which may be so), but sufficient (which is rarely so) to develop an answer to a particular problem. Without an understanding of how the system operates, how the tools applied are related to operation of the system, or how the answer or set of answers relate to reality, the output of such tools is so much gibberish.

In reading this missive, please do not assume that I wish to return to the days of yore. I strongly support and encourage the use of new and better tool. I very much enjoy working with younger geologists and learn so much from them. Their capabilities, especially with computers, far exceed mine and they analyze and incorporate so much data so quickly and efficiently. I guess I just wish that their efforts could be tempered by an understanding of the context of the problem to be addressed, the relevance of the tools at their disposal to the system being studied, the ability to collect...
ADVICE TO STUDENTS FROM AIPG MEMBERS

and understand the value of data, and above all, the ability to communicate to others what they have done, how they did it, and what they conclude.

Bob Kier, Ph.D., PG, CPG-06358

Students, fear not! You will find your job. If you love your field, you will find that dream job. Guaranteed. Remain optimistic and enthusiastic. These are infectious traits and employers pick up on them.

Networking for a job starts with your college professors. They are an invaluable resource and you will need them as references. Good performance and a collegial spirit makes for outstanding letters of recommendation. And the reverse is also true. Good professors relish in the successes of their students. Be collegial.

The next step in networking involves contacts with the professional community. In your area there are organizations that meet monthly, share a meal and a professional talk. Go to these meetings. Introduce yourself and ask questions of them and their work. Recognize the fact you are not the expert they are but wish to become one. Your enthusiasm and drive will be recognized and someday rewarded in a job, albeit entry level. Be involved.

Growing your career involves constant change and a dash of humility. We will never know it all, but neither will anyone else. But recognition of that fact gets you further than arrogance ever will. Be humble.

Unfortunately, in today's saturated job market, hyperbole has become the norm in resume writing. Do not play this game. Tell your experience honestly and up-front. Employers will recognize your honesty and realize they can trust you. Be honest.

To deal with hyperbole, employers are offering internships to obtain a sneak peek at the candidate without penalty. The trial term varies, but the good news is that internships may be an inroad to full time employment. The internship may not pay what you think you are worth but we all remember the story of the hare and the tortoise, eh? Be diligent.

In America, we all value people that work hard. Be willing to stay as long as the job requires. This is really admired. Be industrious.

And when the job interview finally comes, review the solicitation carefully to explain why you are an excellent choice to fill this position.

Be prepared. Good Luck!!

Gerald Kuecher, Ph.D., CPG-09883

I am a hydrogeologist and have worked on just about every side of the “Environmental Triangle”. I started my career with the NJ DEP (regulatory), writing groundwater discharge permits. Later, I worked for a large oil company managing their Underground Storage Tank (UST) program. Then I went into consulting, thinking the grass was greener. Now, and for the last 9 years, I have been working for a natural gas utility company managing various types of environmental remediation projects. My advice to students when preparing for the “working world”, is to really focus on an area of geology that they can use in a job that they will end up loving. As a working geologist/hydrogeologist, I no longer have to do my own cross sections (although it is fun to do sometimes), or log my own soil borings, or fit my own pump test curves. Consultants do much of that and technology has significantly changed since I was in school some 20 years ago. The emphasis of my job is to review and manage large remediation projects, all of which brings in the multitude of geologic sub-areas such as lithology, stratigraphy, hydrogeology, geochemistry and geophysics to name a few.

Currently I am working in a program that focuses on Manufactured Gas Plants (MGPs). These plants were “state-of-the-art” plants at the turn of the 20th century. They burned coal or oil to artificially manufacture gas for lighting and heating. The byproducts of this industry are being unearthed today and found in the form of coal tars, benzene and other hazardous chemicals. Because of the nature of these byproducts (their tendency to sink in the groundwater table), having a complete understanding of the geologic setting, both historical and present, is mandatory if the characterization and remediation are to be successful. I have to constantly work to understand the geology and hydrogeology in order to effectively manage these projects. I can honestly say that I love to come into work each and every day and do what I do. Hopefully, the students out there can find a career that will give them as much enjoyment.

Marc B. Okin, CPG-09227

I am one of many accidental geologists, having gone to Rensselaer Polytechnic Institute to major in electrical engineering, like my father, and then finding this engineering discipline was not for me. I stumbled into geology at the suggestion of my indoor track coach, Jim Dunn, professor of geology at R.P.I. and president of AIPG in 1980. I liked it and got good undergraduate training, including 64 semester hours of geology, an unusually strong academic program. My specialty was petroleum geology, a very strong field for employment when I started, but 3 years later when I graduated, Saudi Arabian oil was first arriving to new refineries on the U.S. east coast and the oil business was going through one of its recurring shakeouts of employment.

I scrambled and found an entry-level job at Leggette, Brashears & Graham (LBG) in midtown Manhattan, New York City. Founded in 1944 by former U. S. Geological Survey hydrogeologists, LBG was the first consulting firm in the nation to specialize in hydrogeology. In 1960, when I joined the firm, there were only four hydrogeologic consulting firms in the country. LBG and a minor spinoff firm known as Geraghty & Miller on Long Island, and firms in Austin, Texas and Seattle, Washington. Clients thought nothing of flying us, first class, from coast to coast to tackle their water supply or mine dewatering problems – how the business has changed! Now we have competitors in every town’s Yellow Pages.

I supervised well drilling and conducted pumping tests in my early years with the firm, long before environmental contamination had become an important issue. Love Canal and the Valley of the Drums changed all that and created a world of new opportunities for hydrogeologists and led them to new interfaces with engineers and lawyers. I gradually rose through the ranks and served as CEO of LBG for 15 years, ending in 1998. Since then, I have been Chairman of the Board, a purely honorific title, as I am removed from administration and now work entirely as a consultant for clients of my choice. How wonderful to have a job that still allows one to work outdoors and solve the problems our clients need help with.

LBG now operates 18 offices in 15 states. For the past 25 years, the firm has also offered services in environmental engineering to complement our hydrogeologic projects. The firm employs...
ADVICE TO STUDENTS FROM AIPG MEMBERS

geologists, hydrogeologists, hydrologists, geochemists, civil engineers, environmental engineers, environmental technicians, and support staff. Professional hires are largely at the Master of Science or Engineering level, but well-motivated Bachelor degree graduates are also commonly hired. The firm presently employs three senior staff holding Ph.D. degrees.

The LBG consulting practice involves virtually every conceivable aspect of hydrogeology and related aspects of environmental engineering. Groundwater supply planning, development and permitting/water rights range from work on regional public water supplies, to localized community supplies, to irrigation supplies for golf courses, recreation facilities and agricultural properties, down to problem well supplies for residences. Projects involving soil and ground-water contamination range from Superfund sites, Brownfields investigation and remediation, large industrial voluntary cleanups, down to corner gas stations and underground tank removals. The firm is well known to the mining and construction fields for dewatering and depressurization investigations and installations. The still-emerging field of risk management in transfer of environmentally impaired properties is a growth area for the firm.

Hydrogeology has been very good to me, and I have made an effort to give something back to the profession by being active in AIPG at both the Northeast Section and the national level. My AIPG activities gave me an opportunity initially to represent AIPG at the American Geological Institute, which has led to a long involvement in the leadership of this federation of geological societies, which represents the science and profession of geology well in the nation’s capital.

More information on LBG is available on our website: www.lbgweb.com.

Russ Slayback, CPG-02305

When the call went out for AIPG members to submit a piece aimed at students, I looked to a panel discussion earlier this year to inform students what it’s really like pursuing a career as a geologist today. My participation at that event relied heavily on personal experiences from the perspective of a younger practicing professional, as opposed to the academics or senior professionals who students hear the most from. The following observations seem worth repeating now in this context.

Working at an environmental consulting firm in a major metropolitan area, I perform professional services for a broad range of public and private clients. This work includes a variety of services falling under the catch phrases investigation-and-cleanup or brownfields redevelopment. Whatever the particular expertise, a project manager like me is responsible for coordinating these projects from start to finish. Or I may arrive anywhere in the process, so it pays to be flexible. A typical week consists of phone calls and meetings with clients, contractors, regulators, and coworkers, bid estimates and proposals, budgeting, work plans, staff orientation, oversight of field testing, occasional field work, data management, risk evaluation, reporting, keeping abreast of regulatory programs, permits and applications, billing and collections, etc., etc.; but above all COMMUNICATION and ORGANIZATION. For anyone considering becoming a consulting geologist, your job will likely be three-quarters interpersonal and management (although technical proficiency remains essential, too).

The most rewarding aspects of this job include the opportunity to accomplish something of redeeming social value, the relatively flexible hours, the generally informal workplace, and a persistent consciousness of the outdoors. Few make a killing at it, but many make an honest living. Not all companies are equal; much depends on the corporate structure, management style, and regional market conditions.

The most bothersome aspects are the omnipresent budget tracking, the days spent surrounded by linear engineers, those who want something for nothing or who will not accept reasonable regulation as the price of business, the inconsistent regulatory oversight, and the presence of far too many people performing environmental work who do not care much about the environment. I suspect some of these gripes are near-universal.

A word of warning: it is not easy to prepare for this career before leaving school. You may get lucky right out of the gate, or like me you may tread the path of most resistance through no great failing of your own. Eventually after a number of temporary jobs and internships, an entry-level position may materialize through a broad network of contacts that it takes time and energy to nurture. Then the dues-paying begins in earnest, performing mostly field work for a couple more years while you also learn about the regulatory environment. This is not to say your schooling is a waste, but you will find the degree provides remarkably little of what you really need to know to win and hold that day-to-day job. Despite the frustrations, my own struggles provided some much needed seasoning. You will learn there are many ins and outs to providing quality service to your clientele, which is the ultimate end if you expect to make it in this profession. And do not forget the scariest traps are those we forge ourselves; remember you can always adjust course down the road. It is your life.

Charles Tiller, CPG-10811

(Charlie Tiller completed a M.S. in 1995, stumbled through post-graduate inertia for over a year, and subsequently advanced to project management at a regional consulting firm in the Twin Cities. Charlie is a CPG and a licensed PG in Minnesota.)

I have observed over 25 years that geology students who choose to make a career out of our chosen field of study can usually lead very satisfying, productive, and well-compensated work lives. It has long been understood that as we geologists enter the workforce and become contributing members of our profession, we must be relatively proficient at making geologic observations, mapping, cross-sectioning and 3-D analysis over time, analyzing, drawing inferences, and extrapolating data trends. Today, the needs are broader as students preparing to enter the workforce in geology and earth science-related disciplines must also be proficient in computer, written, oral communication (including eye contact). We should keep our messages simple and concise. We need to be familiar with the mission statement and protocol of our firm, organization, or agency, remembering to follow-up and follow through. In the current fast-paced work environment, a premium is placed on being organized, practicing good housekeeping, expressing a polite, positive attitude, and demonstrating courtesy to client/customers, vendors, co-workers, and other parties with whom one regularly comes in contact. We in the workforce should dress appropriately for interviews, meetings, office and field
ADVICE TO STUDENTS FROM AIPG MEMBERS

work, etc. Emphasizing and reinforcing these practices, and especially involving oneself in positive and frequent communications with one’s subordinates, coworkers, and supervisor, will go far to make and maintain the new geologist as an indispensable member of any work team/organization and the profession.

As one who deals with environmental issues daily in my work, I am impressed by the immense scope of Environmental Science applications. I see that the choices made by (A) numerous parties responsible for impacts to the environment, as well as (B) environmental/earth science consultants, (C) environmental regulators and other agency representatives can all make significant impact to our earth. Our current [or recent] election season, while not now being dominated by a lot of direct geologic-environmental debate/issues, has still raised a number of other subjects concerning geologic influences pertinent in our news and debates: (1) the availability and price of oil, (2) seeking out terrorist leaders believed hiding in rock caves, and (3) whether or not the season’s hurricanes or any other weather phenomena can be tied in with climate change, the past records of which we know are available in the geologic record.

John H. Weitz, Jr., CPG-10806

Geology has been a rewarding career. Perhaps I am fortunate to have entered the field with little fore-knowledge of market conditions, only an intense interest in mining activities and ore mineral occurrences. In fact, I left a good paying job the summer that copper prices went over 50¢ per pound. Lead and zinc prices fell likewise. Perhaps I am fortunate to have entered the career at an exciting and interesting world that eventually opened before me. I encourage any student with an interest in earth science to follow their dream and enjoy each and every day of their developing career.

Joe Wojcik, CPG-07776

What Should Our Student Member Be Prepared For?

The question is “what should our student members be prepared for”? Having reached the ripe old age of 64 I can tell you the answer is “CHANGE.” I completed my BS thinking I had prepared myself for a career as an “exploration Geologist”, however my best job offer was as a “Mine Geologist” so my thinking changed to starting my career as a “Rock-in-the-box” man. Later, an exploration opportunity was presented and change was necessary to accommodate it. A few years later this company ceased to exist and I decided it was time to broaden my horizons and went to work for a land development company and changed to an urban geologist.

I was now at mid-point in my career and had changed directions three times to meet changing circumstances and unknown to me the cycle was about to repeat.

After several years of being able to come home at night; and watching my son grow another opportunity in my “first love” exploration was offered. Another change was made and several years of exploration and mining followed with progression to the vice president level. My 50th birthday had passed and I felt that I had “arrived” at my goal when a hostile take over of the parent company necessitated a change. Exploration had literally “gone South” to Mexico and I was too old to “ride burros and eat beans”. My decision was to draw on my experience as an administrator (Vice President of a public company), my work with the Regulatory Agencies (all of my career), and my experience as an urban geologist and go to work for a land development company.

John H. Weitz, Jr., CPG-10806

What Industry Wants in a Geologist

What industry is looking for from perspective graduating geologists entering the work place is the ability to handle multiple job functions. Industry is faced with higher operating costs brought on by ever increasing pressures from a variety of restrictions and environmental permitting at home and aggressive competition from abroad. Therefore fewer people are hired as specialists. Instead, those who can “wear more than one hat” are desirable as candidates for many potential job openings.

Communication, interpersonal skills and patience are always valuable commodities no matter where a career path might go in an industrial setting. In today’s competitive market place these types of skills are a requirement.

The graduate geologist interested in working for industry can be expected to assist in areas that are not specifically related to the geological sciences in many cases. A background in economics and exposure to various engineering disciplines are valuable attributes. Being able to work effectively in a team environment with input from other professionals is a must.

The bottom line is that my College Education prepared me to deal with life. Every semester or quarter brings new and different challenges and we learn to deal with the changes just as later in life new challenges have to be conquered. A College Education says this person has demonstrated, 1. At least average intelligence; 2. They are trainable; 3. they will complete at least a four year program; and 4. have a basic knowledge of their chosen field. Everything else will change as life presents opportunities and challenges and that is the fun part.

Roger Ames, CPG-04442

Central and South America, Africa, China, Australia and points in between.

I left the corporate world after 14 years, spent 13 years as an independent consultant and then 10 years as a senior member of a large geological consulting firm.

Fifty years ago, I would not have imagined the exciting and interesting world that eventually opened before me. I encourage any student with an interest in earth science to follow their dream and enjoy each and every day of their developing career.

Joseph Wojcik, CPG-07776

Professional registration or licensure has historically not been a major factor in the past when industry has considered hiring geologists. Now, however, many industries see professional registration as a demonstrable skills test prior to hiring. If this trend continues it may become a condition of employment for some companies. Therefore it would be wise for recent graduates not to relax too long after graduation, but to pursue
ADVICE TO STUDENTS FROM AIPG MEMBERS

I. K. Gilmore, CPG-06039

CAREER ADVICE I RECEIVED EARLY IN MY CAREER

While a graduate student, and during my first ten years after earning my PhD, I benefited from a lot of sound career advice from some eminent geologists. I would like to share the three pieces of advice that stood out:

1. “If you want to become known and recognized, always go into an un-crowded field”
   Raymond C. Moore – November 1956
   (This was offered during a class in “Geological Development of the World” at the University of Kansas)

2. Always take a sabbatical leave, even if you have to go into debt for it. It will always pay off
   (I had to attend a marine science meeting at Johns Hopkins University a month after I began teaching and briefly visited Waters who I knew. When he heard I was teaching, he offered this advice).

3. “There's nothing like looking at an old problem from a new point of view”
   (When I accepted an offer to join the faculty at the University of Illinois, I wrote many Midwestern sedimentary geologists to find out what research they were doing, including their students. All but one sent me a monographic letter about projects being done in their universities. Paul Potter wrote me a three-sentence letter and the above quote, which was extremely sound, proved invaluable for the rest of my life.

One prominent geologist I know heard me open a colloquium with that quote and told me afterwards that it was a reminder to look at one's graduate school notes every ten years and see what was still unsolved.

George D. Klein, CPG-01487


What Students Can Expect After Graduation

Once you have completed all of the prerequisites for your field, obtained an appropriate amount of credit hours for graduation, and completed that walk across the graduation stage that symbolizes the passing of one life into another, you are ready for your geologic career to begin, right? Don't count on it!

Once I graduated I had only one firm offer, that was to move to Yuma, Arizona and begin working underground for Kerr-Magee. At the time I did not think that was a good way to start. Thinking that job opportunities might be better in the government sector I applied for civil service. I scored rather high and was in the top three applicants for three positions in Denver. After my interviews, I felt certain that at least one would come through, since I was the highest ranked applicant for one position and the interviews for the other positions went rather well. Unfortunately, I did not get any of the positions. Now what do I do?

I have always been somewhat artistic and took drafting in high school, so I applied for a position as a geologic draftsman. After unashamedly begging during the interview I convinced the person in charge to give me a try. He must have felt sorry for me because he called me back the next day and I began work as a draftsman for the Rio Blanco Oil Shale Project. Not what I expected, but it was a start.

Part of my eventual duties included assisting the project geologist with reviewing geologic logs and completing fence diagrams. Keep in mind this was during the time when the work was done by hand, computers filled an entire room, and software programs for this type work were not available. That duty did not last long, so I was back to preparing presentation material for the numerous mining engineers from Amoco and Gulf.

After about two years, I noticed an advertisement in the paper for a geologic technician. Little did I know that the company that advertised the position was the same water resource firm working on the Rio Blanco Project. Consequently, I was hired not so much for my abilities, but because I was familiar with the project.

Through attrition, I quickly became project geologist for the firm and began working on water resource projects. After about two years, a chain of events led me to the environmental field conducting baseline studies for mining companies.

Several years past and an economic downturn forced me to begin work for a transportation company conducting environmental impact studies and environmental assessments for highways, airports, light-rail, and other transportation related projects.

Eleven years later I found myself on the outside looking in, again. However, this time I was much older and jobs with other companies and the government were scarce. I did have one thing on my side though, and that was I had a varied background and had built strong relationships with some of my clients.

I was soon working for a petroleum marketer as their in-house environmental consultant, keeping their operations in compliance, conducting environmental site assessments for acquisitions, and managing and conducting soil and ground water cleanup on several of their properties.

I have since moved on and I am now working for myself conducting cleanup operations and providing compliance for several petroleum marketers.

The point of this little tale is that your future is never set, but if you can be flexible and keep your options open you can carve out a career that is satisfying. Every job I had I learned something new and was able to apply that knowledge to the next position. My firm belief is that the more varied your background the better off you will be in regards to problem solving, both on the job and in your career. In addition, someone once told me that you should watch whom you step on while moving up the career ladder, you might meet them again on the way down.

Good luck and always keep your eyes and mind open.

Tom K. Martella, CPG-06416
ADVICE TO STUDENTS FROM AIPG MEMBERS

What should you be prepared for when you choose a career in environmental consulting?

When I declared Geology as my major (1982), a senior in the geology department took me aside and advised me to take every groundwater course I could get under my belt before graduation. To this day, it is the best advise I have ever received. It was a ticket to a new and quickly developing career choice that existed for very few at that point in time. I have made it my career for the past 20 years and enjoy it to this day.

It is very interesting to note that I would give the same advise to any 3rd or 4th year geology student today considering a career in environmental work...and then I would tell them to specialize in Risk Assessment techniques and/or groundwater modeling in pursuit of their Master's degree. I would also let them know how important groundwater geochemistry is to this profession. People with those skills will move quickly through the ranks of most environmental consulting firms.

The following are some of my personal ‘Expectation Pointers’ for the beginning of a career in Environmental Consulting.

1. Expect to start out working in the field (and look at it as an opportunity for the first couple of years. Do not underestimate the value of becoming a field-savvy hydrogeologist.
2. Get involved in knowing the basic hydrogeologic field work at the beginning of your employment. It is a lot easier to spec-out the construction of a monitoring well if you have constructed a few dozen in the field with the help of a seasoned driller.
3. When you go to a site to lay out the well locations picked by a senior member of the staff, observe the pattern. Do not be afraid to question the value of those locations as opposed to alternate locations you might think are of more value in assessing the direction of groundwater and/or contaminant movement.
4. Log enough soil and rock samples to know what ‘normal’ should be...that’s the only way to know how to identify what looks to ‘abnormal’. Hand-bail a few monitoring wells...it will teach you to appreciate the value of today’s sampling pumps.
5. Expect to sit through lots of training. In those sessions, learn as much about the Health and Safety aspects of your job as possible. When you are directing the job as a senior staff person, you will be the one other staff look to for guidance on protecting their health and safety.
6. Expect to know and live by the environmental laws of the governmental agency(s) with jurisdiction on your project site. Be an asset to your client by getting to know the options available in the given situation.
7. Get involved in project planning as early as possible. You will learn lessons in those planning sessions that will prove invaluable later in your career. Follow a project through from start to finish as early as possible. The assumptions you make in the planning process will change as the data is gathered and analyzed...do not just gather data, be confident that your geological training prepared you to make pertinent observations that could have a dramatic affect on the outcome of your projects.

There are hundreds of other bits of wisdom that I encourage other experienced geologists to share with their younger brothers and sisters in the field.

Greg Smith, CPG-08348

New From the USGS...

GEOLOGIC INVESTIGATIONS SERIES MAPS


This map presents the stratigraphic and structural setting of volcanic and sedimentary strata deposited during the past 35 million years across 4,430 km2 in central Oregon. Snowfall in the Cascade Range (west part of map area) recharges important aquifers in the Deschutes basin (central part of map). The area includes the majesty peaks of the Three Sisters volcanoes, where continued eruptions of basalt and rhyolite in the past 3,000 years indicate an ongoing volcanic hazard. The Sisters fault zone, with several potentially active faults, crosses the map from southeast to northwest.


I-2775. MISSOURI. Geologic map of the Fremont Quadrangle, Shannon, Carter, and Oregon Counties, Missouri, by R. C. Orndorff. 2003. Lat 36°52′30″ to 37°, long 91°07′30″ to 91°15′. Scale 1:24,000 (1 inch = 2,000 feet). Sheet 45 by 33 inches (in color). $7.

The mapped quadrangle includes widespread plains materials, with numerous coronae, volcanic flow, and crater units. Structural features include very abundant wrinkle ridges that commonly occur in bundles, and extensional lineaments, many of which are associated with coronae. Although coronae are dominated by extensional structures, many are linked by belts of contractional wrinkle ridges resulting in an apparently chaotic pattern of stress orientations. The volcanic history does not suggest a temporal change in dominant eruptive style.

I-2794. Geologic map of the Bereghinya Planitia Quadrangle (V-9), Venus, by G. E. McGill, University of Massachusetts. Prepared for the National Aeronautics and Space Administration. 2004. Lat 25° to 50°N, long 30° to 0°E. Scale 1:4,711,886 (1 mm = 4.712 km) at 25° latitude and 1:5,000,000 at 34° and 73° latitudes; Lambert Projection. Sheet 43 1/2 by 34 1/2 inches (in color). (Accompanied by 17 page text.) $7.

The mapped quadrangle includes widespread plains materials, with numerous coronae, volcanic flow, and crater units. Structural features include very abundant wrinkle ridges that commonly occur in bundles, and extensional lineaments, many of which are associated with coronae. Although coronae are dominated by extensional structures, many are linked by belts of contractional wrinkle ridges resulting in an apparently chaotic pattern of stress orientations. The volcanic history does not suggest a temporal change in dominant eruptive style.

I-2800. Visualizing the geology of lake trout spawning sites; northern Lake Michigan, by Peter Dartnell, Peter Barnes, U.S. Geological Survey; J. V. Gardner, University of New Hampshire; and Kristen Lee, U.S. Geological Survey. Prepared in cooperation with the U.S. Army Corps of Engineers. 2004. Two sheets. Lat 45°35′ to 45°40′, long 85°57′ to 86° and lat 45°42′ to 45°46′, long 85°20′ to 85°23′ and lat 84°58′ to 85°13′, long 45°22′ to 45°23′; sheet 2, lat 85°47′ to 85°59′, long 91°07′30″ to 91°15′. Scale 1:2,000,000 (1 inch = about 1,750 feet); sheet 2, 31,250 (1 inch = about 2,083 feet) and 1:22,000 (1 inch = about 1,833 feet). Sheet 1, 46 by 38 inches; sheet 2, 43 by 37 inches (both in color). $14.

USGS Toll-Free Information: 1-888-ASK-USGS (1-888-275-8747) or http://www.usgs.gov
How to Survive a Geology Career: What to Prepare for in the Working World

Michael J. Kirby, CPG-08486

My Story

I am writing this from my perspective of more than 18 years as a professional geologist in the petroleum and environmental fields, as well as having spent 14 years teaching college geology on a part-time and full-time basis. My first job after completing my Master’s degree was in the oil patch with a large independent during the boom days of the late ‘70s and early ‘80s. Petroleum geology was great fun and I was able to utilize a lot of sedimentology, stratigraphy, and structural geology skills to develop exploration and development prospects. I had great support resources and learned a lot working with other geologists, geophysicists, engineers, petroleum landmen, and economists. In 1982, the oil patch started shrinking and I experienced my first layoff. Throughout the next 6 years, I worked with small and large independent petroleum companies and had to expand my skills into basic geophysics and petroleum engineering to varying degrees. Generally, the smaller the company, the more I had to expand beyond geology. With the price of oil hitting about $9/barrel and then not rebounding much afterwards, thousands of petroleum geologists were on the street and not many were being hired. I decided that I wanted to stay a geologist, I would have to make the transition to the environmental field.

I entered the environmental field in 1989 and experienced a culture shock. In the oil patch, projects were budgeted in the millions of dollars; in the environmental field, projects were budgeted in the thousands. Working for a consulting firm, projects needed to be completed in a short time and could not be studied for months or years as they were in the oil patch. There were fewer resources and support staff available. The environmental industry was relatively unsophisticated at that time and existing data and established field and analytical techniques were not well developed for many projects. Over the last fifteen years, the environmental field has gotten more mature and sophisticated. Basic skills in biology, physics, chemistry, and geology have come in to play to augment my hydrogeology and hydrogeochemistry background as I work on more complex and sophisticated environmental problems.

During my environmental career, I also taught part-time in community colleges, teaching physical geography, astronomy, oceanography, geology, and environmental science courses. After the third company I worked for got sold out from under me (an environmental company after two oil companies went belly up), I decided to get a Ph. D. in hydrogeology with plans to teach full time. I taught for two years as an assistant professor teaching hydrogeology, soil science, physical geography, and several specialized environmental courses. In my teaching, I tried to prepare my students for what they would face as an environmental professional. After those two years, the fates brought me back to environmental consulting, where I currently work as a hydrogeologist for a large consulting firm. Change and a need for flexibility seem to be common themes for geologists after they enter the workforce. Do not assume that you will only have one career or stay employed with one firm! It seems employment in the environmental field is driven by who wins the contracts.

What I got in college that prepared me for the work world

Fortunately, I had a strong undergraduate geology program with a good fundamental science base. My master’s and doctoral work provided me with advanced knowledge and skills that I could apply in the work world. The courses and skills that have been most helpful to me include: sedimentation, stratigraphy, structural geology, mineralogy, petrology, field methods, geomorphology, hydrogeochemistry, hydrogeology, map interpretation and generation, chemistry (including organic and hydrogeochemistry), biology, physics, technical writing (thesis, lab reports, papers), math (trig, geometry, algebra, and basic calculus to understand flow equations), statistics, and computer skills (spreadsheets, word processing, modeling, workstations, and internet research). This might seem a long list, but I need and use knowledge from all of these on a weekly or daily basis.

Through my geology courses, I got a strong background in technical analysis and report writing, which comprises most of my daily work. Besides having the appropriate degree(s), these are the primary skills that companies are looking for in a geological professional.

Dilbert isn’t that far-fetched: Life in a scientific or engineering company

If you read the Dilbert cartoons in the newspaper, you will have a pretty good idea of what goes on at an engineering or science-based company on a daily basis. At least it seems like that some days. Everything does not always go as planned: expect the unexpected, changing scopes of work, managers who do not...
get it, thinking on your feet, equipment failures in the field, weather problems, and other snafus that may arise. Business skills such as thinking “outside the box”, time management, team dynamics, and creating easy to understand presentations can be developed in school, but are usually learned and perfected on the job. The earlier you can develop these skills, the better off you will be.

You may get a cubicle, or you may get lucky and get an office. Fortunately, I only had a cubicle for a year and a half. It was hard for me to work in one of those, but some people do it just fine. If you are good at concentrating in noisy situations, and enjoy working in limited space, you will like cubicles. Generally, the company will provide your computer and all the accessories and tools you need to do your work.

Your co-workers will come in a variety of flavors: some competent, some not; some friendly, some not; some cooperative, some not – just like at college. At the end of the day, however, you will have to work with all of these folks in some sort of team effort to accomplish your goal, whether finding a multi-million barrel oil field or cleaning up a Superfund site. Expect to work with non-scientists including engineers (they approach technical issues differently than the way scientists do), business development and marketing people, accountants, financial analysts, field personnel with high school educations, clients who know nothing about science, and the general public. If you cannot sell your ideas, they are generally not going to be executed by the company. People skills are important to your success. If you do not have strong people skills, work on them.

Expect to work overtime, on weekends, and occasionally holidays. Some companies pay you for this, others do not. Do not like 8 o’clock or evening classes? In the work world you may start at 7 a.m. or earlier and work into the night. It is all part of the job, but you generally get compensated, either in time off or with extra money, by working more than 40 hours/week. Employers now expect miracles to happen on a regular basis. Project schedules seem to be accelerated and there is often a rush to complete things on time. Proposals and reports need to be nearly perfect to compete in today’s business world. A senior project manager in the environmental field once told a class of mine, “90% right in school is an A; in business, it’s 10% wrong”. An interesting perspective, and often true.

Should you take engineering courses to help in your career? If you have an interest, I would say yes. If you just need basic engineering skills to perform your job as a geologist, you will pick these up on the job. Cost analysis, budgeting, health and safety training, advanced computer skills, and project management skills are skills you will pick up once you are on someone’s payroll. If you need the training for the job, a good company will pay for it. If you come into the job market with strong basic science skills, strong interpersonal skills, and the three R’s, you will be able to pick up other skills relatively easily.

Professional organizations are great things to join. If you join as a student, the dues are usually fairly inexpensive. There is usually less paperwork involved to move to a full member if you join as a student. A number of companies like their employees to join and be active in professional organizations. It looks good for the company. Once you qualify, get a professional license or two. These are necessary for some environmental projects and look good on a resume when you are looking for a job or getting a promotion at work. Professional organizations are a great place to network and meet future business partners or customers. I found my current job through a contact I had from AIPG back in 1994-1995.

And the bottom line is . . .
Managers seem to love bulleted lists, so here goes:

- Career change is not unexpected for the 21st century geologist.
- Tolerance in geology, you must be flexible.
- Prepare well academically, build on the fundamentals. Writing, reading, and arithmetic are basic skills at work.
- You do not need to learn everything in school. Learning continues once you start work.
- People skills are as important as technical skills.
- Professional organizations are good networking tools.

Michael J. Kirby, CPG-08486, Shaw Environmental, Inc., 4400 College Blvd., Suite 350, Overland Park, KS 66211

AIPG Scholarships Awarded for 2004

The AIPG Executive Committee awarded three AIPG Student Scholarships in 2004. A two thousand dollars scholarship was awarded to Nancy Price, SA-0382. In 2004 Nancy was a non-graduating senior at The Richard Stockton College of New Jersey located in Pomona, New Jersey. Nancy anticipated completion of dual Bachelors of Science degrees in both Geology and Biology in May of 2005. AIPG awarded one thousand dollar scholarships to both Tristan H. Jones, SA-0433, and Andrew T. Nugent, SA-0310, from Central Michigan University. Tristan is majoring in Geology with a concentration in Hydrogeology/Environmental Geology. Andrew graduated August 2004 with a Bachelors of Science in the Geological Sciences.

Students Apply Now for 2005 Scholarships

Applications must be received by February 15th and scholarships are awarded the month of September.

Applicants must submit: a letter of interest with name, mail and e-mail address, and telephone number, proof of enrollment in an eligible geological sciences program, transcripts, an original one-page essay on why the applicant wants to become a geologist, and a letter of support from an faculty member familiar with the applicant’s academic work.

Eligibility Requirements: Any student who is majoring in geology (or earth science), is a least a sophomore, an dis attending a four-year accredited college or university in the U.S. can apply.

For full details see page 6 of this issue, call AIPG Headquarters at (303) 412-6205, or www.aipg.org.
So You Wanna Be a Geologist!

By Neill H. (Vic) Ridgley, CPG-05138

As a long-time minerals explorationist, I would not be doing my duty to potential successors unless I clued you in. Consider this chronological career resume, and ask yourself if you really want a career in geology?

Be prepared to... try and act your way out of a confrontation with a black bear, when you mistakenly take your dogs on a mapping expedition in the woods.

Be prepared to... graduate during one of the frequent mining industry recessions and make hundreds of contacts trying to find a job.

Be prepared to... be seriously unemployed.

Be prepared to... take a long-term assignment in a foreign country at substandard wages (because you just graduated) and try and live on their equivalent of food stamps.

Be prepared to... live in an apartment on a cobblestone street used for practicing repairs on public utilities (gas, electricity, water) by a steady stream of pick-wielding laborers.

Be prepared to... want to work so badly you agree to a mapping project in western Arizona in July, August, and September.

Be prepared to... do some Dumpster-diving in Wickenburg to retrieve a large supply of empty soda cans to use as containers to attach mining claim notices to claim posts.

Be prepared to... get shot at, when you overtake some lapsed mining claims, and the former tenant learns of your staking program through town gossip and decides to 'rectify' the situation.

Be prepared to... use a private security company to enforce your claim rights, only to have the security company suggest to the tenant that he, too, needs their help.

Be prepared to... have to take your 2-year-old daughter on a winter drilling project in 2 feet of snow, and periodically lift her out of the back of the Bronco so you can help her write her name in the snow.

Be prepared to... sit in the same lounge night after night and listen to an otherwise gracious and talented crooner give her nightly rendition of 'Rocky Top' to satisfy a demanding audience.

Be prepared to... option a property and have the owner's explain that the reason for the bullet holes facing outward from the core shed is that they were inside when they shot at the rattlesnakes.

Be prepared to... have the same owners show you a mysterious uranium anomaly on the ground which only comes to life when the scintillator stored on the military Jeep's center console gets close to the radium clock dial on the dashboard.

Be prepared to... have to mulch, by hand, a mile-long bulldozer trail in a temperate rainforest with 200 bales of straw, with the first passage of the dozer, and every time thereafter.

Be prepared to... get lost. Try to find your way through the rainforest developed on 45° slopes, overgrown with rhododendron on the north-facing slopes and briar patches on the south, where the only lines of access are ridge-tops and creek bottoms.

Be prepared to... explain to a public scoping session that your company did not order the state highway department to build a new road through the Appalachians to create fresh road cuts.

Be prepared to... get hammered by senior management for not hacking a new route (for exploration reconnaissance) through the rhododendron with each trip out from the creekbed drillsite, packing 2 boxes of BX core on each trip.

Be prepared to... get stung. Try to take a long looping traverse through the rainforest and inadvertently kick a log brimming with yellowjackets, at the far end of the traverse. See if you can outrun the yellowjackets.

Be prepared to... take a group of environmentalist watchdogs on an inspection tour, and have the dentist in the group ask, “Do mining companies usually drill down, or drill up?”

Be prepared to... take a Federal bureaucrat on an inspection tour, and have him ask (1) whether any animals live in the forest and (2) how the deer get up and down the steep hills.

Be prepared to... try jogging near the I-40 overpass in Grants (N.M.) and have the local law stop you to ask what you are doing. When told it is ‘jogging,’ they ask, “What’s that?”

Be prepared to... be told by your employer that it is a waste of money to rent a backhoe to dig mud pits, since the geologists could do them as well by hand.

Be prepared to... start a drilling project with a sadistic driller in farm country, and have him take advantage of the above situation to threaten deliberate sump overflows (flooding wheat fields), thereby intimidating the geologists into digging pits at breakneck speed, one step ahead of his water discharges.

Be prepared to... talk your way out of a new job by trashing your old employer, who happens to be a golfing buddy of your potential new employer.

Be prepared to... drive across a Montana field with 10 inches of grass to stake a drill site, and have the rancher come running out of the house screaming that you just ruined his best haying ground.

Be prepared to... preplan a Montana exploration plan 6 months in advance, with every planned hole preplotted and justified on a permit application.

Be prepared to... bet a driller’s helper he can not make a broad jump across a mud pit.

Be prepared to... be seriously unemployed.
SO YOU WANNA BE A GEOLOGIST!

Be prepared to...want to work so badly that you offer to cut your daily, camping-and-tent-based rate from $100 to $75.

Be prepared to...get minuscule funding from a Canadian junior and then amaze him when you actually turn in a serious geologic report and a drilling proposal.

Be prepared to...want to work so badly you agree to a mapping project in Bullhead City in July.

Be prepared to...take petroleum source rock cuttings from a deep, expensive well and package them in canning jars in ordinary cardboard boxes for shipment to an analytical lab because the guy you work for thinks that sealed paint cans cost too much.

Be prepared to...be seriously unemployed (again).

Be prepared to...be told that the mineable reserves of a dipping limestone bed can not be calculated unless drillholes are oriented perpendicular to bedding.

Be prepared to...be told that every geologist on a drilling project should be able to make do with one mechanical pencil (“pencils do not grow on trees”).

Be prepared to...be told that faults do not curve.

Be prepared to...be told that there are probably no more overthrusts to be found in north-central Nevada.

Be prepared to...be seriously unemployed ( encore).

Be prepared to...do something else, for a lot less money.

Be prepared to...be seriously unemployed (yet again).

Be prepared to...do something else, for pretty decent money.

Be prepared to...be seriously unemployed.

Be prepared to...do something else, for a lot less money.

Be prepared to...be seriously unemployed.

Be prepared to...rise, Phoenix-like, from the ashes of previous downturns.

Oh, yes, I forgot to mention:

Be prepared to...have the time of your life! I would not have missed it for anything!

Vic Ridgley is career minerals geologist who worked 5 years each for the French Atomic Energy Commission and Marathon Oil in uranium exploration, 10 years as a consultant to Santa Fe Pacific Gold in development and geologic modeling at the Twin Creeks Mine in Nevada, and had numerous other interludes of unpredictable employments.
Students: Gazing Darkly Into the Future — Career, Life, and Everything

David M. Abbott, Jr., CPG-04570

Douglas Adams, in The Hitchhiker's Guide to the Galaxy, asserts that the answer to the ultimate question about life, the universe, and everything is 42. He also notes that if you do not understand the question, you will not understand the answer. This article reverses that Geology 101 maxim, “the present is the key to the past,” by believing that the past—the experiences of those who have been out of school for a couple of decades or more—has something to tell you about your futures.

You have begun your geoscience career by majoring in the subject. Perhaps you have already acquired experience in the field through summer and/or part-time jobs. Regardless of the specialty you are pursuing, you can expect that the cyclic nature of the business will result in your having several employers. If the experiences of those who went before you provide any guidance, it indicates that in order to stay employed, you must be flexible enough to switch specialties, perhaps more than once. For example, moving from the petroleum business to hydrology or environmental geology can build on the realization that fluids moving through rocks behave in similar ways. The analysis of fractured crystalline rock aquifers has similarities to the movement of mineralizing solutions through similar rocks. Coal is not only a fuel itself; it contains another fuel, methane. The point being that basic geologic skills are needed regardless of your current or future specialty. Some of you may even have done some specialty switching in school because of job opportunities or research support.

Reflections on a Geologic Career, which available for free at the AIPG website, www.aipg.org under “AIPG Publications,” contains a variety of papers addressing the issue of finding and retaining professional positions. Download a copy and read it for a wealth of practical advice. The authors provide answers to questions they wished they had known when they were your age. Key points are expecting that change will occur, being flexible, and networking through active participation in professional societies. An advantage AIPG offers as a professional society is that its members are from all specialties and employers, so you become part of a broader network when it comes time to switch specialty.

But your professional career is only a part of your life—at least I hope so. Joining with a spouse is a common big step in life. Some of you have already taken this step or have specific plans for doing so. For others of you, this is still something in your future, but probably enough of your friends have coupled up so that marriage is less of a theoretical concept than it was in high school.

Being part of a couple usually leads to two other life characteristics (features or bugs, depending on how you look at them), a house and children. The mortgage must be paid every month. Children have lots of ever changing needs and wants, most of which cost money. Your job provides the income but its location affects your style of life. Relocations are disruptive to a greater or lesser degree. Some locales have greater job opportunities than others. The same is true of educational, cultural, and other characteristics. Some people pick a place to live and do whatever is required to live in that place. Others follow their career, relocating whenever relocation is required.

While only you can provide answers to the issues discussed above, they are very real issues that you should carefully consider in planning your career. A planned career is far more likely to be successful and rewarding than an unplanned one. While no one can see into the future, you can learn to spot trends and make necessary adjustments in what you are doing. You should have goals in mind. Although being open to serendipity is worthwhile as well. All your opinions and choices have consequences. Think about the consequences of your choices as you move through life.
Tom Simpson, CPG-10755

I was always interested in the basics of how everything works on this planet. That is what precluded me to a career as a scientist. I am always amazed at the level of knowledge that most people possess about this wonderfully sensitive and miraculous big blue marble that we live on. That level is unfortunately next to nothing. Why is the sky blue? How does gravity work? Why are trees green? How did that canyon get made? Who puts the sand on the beach? Why is the sun hot? These are just some of the questions posed to me by my children. Thankfully, being a scientist, I can answer these questions with a degree of certainty. I can tell them why things happen. That is what precluded me to a career as a scientist. I am always amazed at the level of knowledge that most people possess about this wonderfully sensitive and miraculous big blue marble that we live on. That level is unfortunately next to nothing. Why is the sky blue? How does gravity work? Why are trees green? How did that canyon get made? Who puts the sand on the beach? Why is the sun hot? These are just some of the questions posed to me by my children. Thankfully, being a scientist, I can answer these questions with a degree of certainty. I can tell them why things happen.

Thinking back to when I was a geology student at Western Michigan University, I was not 100% sure what I wanted to do with my degree. Was I going to work in the petroleum industry, environmental industry or research? I wanted to be the flannel shirt type geologist that roams around on rock outcrops, does field studies and theorizes about geologic processes and premises. Well, those type of jobs seemed pretty hard to come by and really do not pay well (unless you are very lucky).

Given the courses that were made available to me at WMU, I decided to focus on environmental consulting as a focus for my career. WMU has a well known field hydro program that seemed to fit like a glove and is a great start to this type of career. From there, it was on into the cut-throat field of consulting. Currently, I have retired from consulting to be an environmental regulator with the State of Michigan. Life, for me, is much easier when one is not chasing the almighty dollar. The science of the industry becomes the focus, not the bottom line. However, to each his own.

I wanted to convey a few words of advice to aspiring geologists getting set to enter the real world of geology/hydrogeology. One of the points I wanted to relay to the students of the trade is to be sure you get exposed to a wide variety of the different fields of science. For instance, typical hydrogeologic work will include the following backgrounds (geology included of course) at one point or another: chemistry, biology, geography, technical writing, remote sensing, geophysics, sedimentography, oceanography, philosophy (for the theorists), computer aided design and modeling, accounting, ergonomics, public speaking and interaction, real estate, law, etc.

The second point that I want to convey is to learn to write technically. This is the most important part of any scientific career. A great scientist is only as good as his presentation of his findings. Otherwise, no one will be able to tell what he has done. Technical writing in the environmental consulting field is of the utmost importance. This skill alone will most likely make or break your career and limit your advancement opportunities in this field if you cannot do it well. The main primer behind my opinion for this is because of the answer to the following question: What will your client receive at the completion of a project? The answer to this, in most cases, is a report of some nature. Typically, when the consultant’s job is complete, the client is left with a nice, clean piece of property. No building, or fancy bridge, or cool new product. Just a newly seeded lot or a large gravel covered area where a former facility used to reside. Our work is done mostly underground. So, there is typically no visible finished product. The basis of integrity for your work is contained within your final deliverable…a written report. This written report represents all the field work, data, planning, design, construction, operations and maintenance, and so on, and sums it all up in a fairly thick and tumultuous document. This report is what you are selling. Therefore, if you cannot convey your findings, recommendations and conclusions in a clear, concise manner, the client will not be pleased and your firm will not get repeat business, which is the name of the game.

To summarize, my very basic words to the wise are: find a niche you are enthusiastic with, learn all you can about a wide variety of disciplines, learn to write technically and realize that there is always more to learn.
The Challenging and Rewarding Career of Environmental Consulting

John W. Jengo, CPG-08139

The field of environmental consulting, specifically the work performed by geologists and hydrogeologists, remains a viable employment option for students graduating in 2004-2005. Environmental consultants are hired by industrial, commercial, or governmental agencies to provide guidance and recommendations on a wide variety of environmental problems, such as the characterization, delineation, and remediation of contamination from pollutants, toxic substances, and hazardous materials. Environmental consulting firms normally employ a multi-disciplined staff of scientists, including a large number of geologists and engineers, and other specialists such as biologists, database managers, and field technicians with expertise in the construction, operation, and maintenance of remediation systems.

As typically defined, the position of a geologist or hydrogeologist in an environmental consulting firm would involve:

- initially performing tasks such as soil boring logging, monitoring well installation and development, soil and groundwater sampling, aquifer testing, and data reduction and tabulation;
- making a gradual transition into larger task and project management, letter and report writing, local client interaction, and immersion into a specific technical specialty such as groundwater modeling, groundwater sampling techniques, or risk assessment; and,
- ultimately reaching a career maturation that would involve program management, involvement in direct regulatory negotiations on behalf of clients, corporate client interaction, large-scale proposal development, business development, expert witness testimony and litigation support, supervision of a staff of less experienced professionals, and a position within your company as the reigning technical expert on investigation/remediation methodologies or industrial practices.

Although colleges and universities have well-established curricula that prepare students in the technical basics of geology or hydrogeology, the graduates that I have encountered in the past five-to-ten years have been unprepared in certain critical skills necessary to succeed in environmental consulting. Additionally, and by no fault of their own, these graduates were ill equipped for the business dynamics and non-technical challenges posed by this profession. As such, I offer the following counsel and advice to young geologists who are currently assessing whether they want to enter the environmental consulting field as a geologist or hydrogeologist. Let us start with the top five tacit, dispiriting aspects of this profession:

- Itinerant Job Changes: You will probably change employers at least three or four times throughout your career, for a multitude of reasons. There are the twin plagues of billability and backlog. Like attorneys, environmental consultants bill their time back to their clients and there will be an expectation early in your career that you will achieve at least a 90-95% billable goal. This translates into a normal working week of 45 to 50 hours to ensure that your billable goal is met; this is not necessarily an issue if your company is winning a lot of work and you are willing to work 10-hour days, but it can develop into a major problem in winter months and during economic downturns when your company’s backlog of work is low. You may find yourself released by your employer because of lack of billable work or you may leave on your own accord seeking a less stressful billable goal. Even after becoming a project manager later in your career, you are vulnerable to employment instability. Because environmental consulting is fundamentally a business, your company may become dissatisfied that your revenue generation has hit a plateau, perhaps because you decided to focus on delivering a quality product to a select group of clients, not building an ever-increasing empire that you ultimately have little direct control over. Lastly, my personal experience has been that you can lose your job when you expose unethical behavior (see Unethical Consultants below); this loss of employment occurs because the powerful forces orchestrating such deceit will seek to destroy your career and reputation and your company lacks the conviction and courage to stand behind you.

- Loss of Projects Unrelated to Your Performance. We would all like to think that if we do a good job and meet a client’s expectation, the projects we are working on would remain secure under our auspices. Unfortunately, this is not always the case. The corporate office of your favorite local client might implement a “contractor convergence” program that results in a loss of work because these projects were awarded to a less expensive or larger environmental consulting firm who offered your corporate client an economy-of-scale cost reduction. Remember, the industries that hired your company generally consider en-

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job security and so they will repeatedly extend the life of projects for their own benefit, which is not in the best interest of the client. On the other hand, there are also licensed professionals who are dedicated, and motivated individuals who are genuinely interested in their work and the success of the project. These professionals are willing to exert themselves to the fullest extent possible, even if it means working long hours and weekends.

The Achilles Heel of Regulatory Oversight and Enforcement:

We all had a vision coming into this profession that the Federal and state governments provided both the roadmap and stimuli that generated environmental work; however, you will find that environmental regulations and USEPA/state regulators hired to enforce those laws will not be the primary incentive for environmental progress. With environmental regulations being eased (or not reauthorized) and many regulators unable or unwillingly to be a positive influence on the process, it will be real estate transactions that are the true impetus for environmental investigations and cleanups. This is because businesses looking to purchase a contaminated property need to identify and document the pre-existing environmental problems at a site in order to be relieved of the liability for such impacts. Sites can become characterized and in some cases remediated as part of a real estate transaction in the time it takes some regulators to review a single report and issue a comment letter, if they issue one at all. The job of an environmental regulator is a largely thankless and low-paying occupation. Most regulators are earnest individuals who are completely overwhelmed by caseloads that preclude them from being actively involved in any one case. However, there are also some regulators who are simply unmotivated to initiate positive change or are so morally compromised that they are sycophants and enablers of the very industries they should be regulating. On the other hand, there are some regulators who desire to extend the life of projects for their own job security and so they will repeatedly issue redundant and pedantic comments that reopen issues that were thought by your client to have been resolved. Unfortunately, if your projects are being overseen by such regulators, do not expect to be able to successfully close out sites in a timely fashion.

A Confederacy of Mediocrity:

In a perfect project, each participant would be equally caring and informed about the progress of the work and equally vested in its success. However, you will likely be the most committed person working on a contaminated site and the one who will receive a disproportionate amount of blame should the project go awry and virtually no credit should the project succeed. Regulators will view you as a soulless mercenary who seeks only to help your client avoid complying with the law. Your clients, even the good ones that you enjoy working for, will have difficulty accepting the amount of money it will take to retain you; as such, most clients will seek to reduce the necessary scope of work to an absolute bare minimum. In the end, the project will be a failure and the environmental problem will remain. Should you interact with attorneys, expect them to pressure you to rewrite your investigative findings until they are utterly devoid of meaning. And be prepared to be retained by clients who actively, but subtly, seek to circumvent compliance with the law, a task that they fully expect you to handle without implicitly being instructed to do so, so that they can appear to be guiltless should such a tactic fail.

Unethical Consultants:

Despite the aforementioned challenges, it would be nice to believe that every environmental consultant would conduct themselves in an ethical and professional manner. Sadly, this is not true and in fact, you will probably devote an enormous amount of time both defending your work and critiquing the work of others that you know to be laced with falsehoods. Perhaps the most disappointing aspect of this commonplace corruption is the reality that you face. You will face off against other licensed geologists who will knowingly omit essential context in their reports to regulatory agencies. They will pick and choose data to support a predetermined result and craft their reports to be meaningless and vague, using words such as “apparently” and “ostensibly” that are intentionally illusory and misleading. One of the most commonly encountered ploys is the double-entendre statement “There is no data that indicates an impact to the subsurface.” These consultants will want the regulatory agencies to read such a statement and conclude that there is no environmental problem although the truth is that there is no data. I know this sounds implausible, but keep in mind that these consultants are knowingly taking advantage of either overtaxed or morally compromised regulators who do not attempt to verify the veracity of such nebulous statements. I am continually amazed how often this gambit is used and how successful it is. So be prepared to encounter opposing geologist reports rich with rhetorical license that push, but do not quite break through into reportable unethical behavior since these geologists can always claim that their reports were misread or misunderstood by the reader.

Provided that you have gotten this far in the article and have not run out to change your major, you may be asking what are the positives about being a geologist or hydrogeologist in the field of environmental consulting?

• True Talent Will Prevail:

There is a shortage of detailed oriented, dynamic, organized professionals who write well and have the requisite geological and interpersonal skills to enable them to interface successfully in an industrial setting with a diverse group of people from PhD’s to maintenance workers. Come into this profession with this nascent skill set and you will succeed immediately. Continue to develop these skills and you will be managing your own projects in 5-10 years, forming a cadre of younger professionals around you to form a highly effective team, and, with a few breaks, you will have more work than you can handle. This profession, and the regulatory community as well, needs an infusion of talented, dedicated, and motivated individuals to elevate the quality of environmental work being performed across the country. This is also a profession where you, as an individual, can be the single most constructive influence for positive progress on a project; in fact, your involvement and your unique talents may truly be the only difference between action and inaction at a contaminated site.

• A National Problem:

Given the pandemic state of environmental impacts, you can find employment in virtually
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Every region of the country; there are very few scientifically-based professions that are as geographically unrestricted as environmental consulting. Every state has a combination of abandoned and active industrial sites and perhaps an additional burden of government, military, and mining sites, which have traditionally lagged behind private industrial sites in terms of characterization and remediation. Not only have few sites been successfully remediated and closed, most sites are being investigated for the 2nd and 3rd time, a result of improved investigative techniques, new cleanup standards, and the general inadequacy of the initial site characterizations that were performed in the 1970s and 1980s.

The Further You Go, The Deeper It Gets: Throughout your career, you will continue to learn about an eclectic array of environmental issues/methodologies from asbestos abatement to x-ray diffraction. You could work on a site for your entire career and still continue to uncover nuances about its history and hydrogeology. The number of divergent career paths within environmental consulting that you could pursue are quite numerous and it is likely that one of these paths will converge with your personal and professional interests. Perhaps it will be computer modeling of groundwater and LNAPl, remedial well and trench design, database management, GIS applications, risk assessment, geochemistry, or contaminant degradation and attenuation. Being an expert in one or more of these sub-disciplines will help ensure that your services remain valuable to your company and your clients.

Employer Checks and Balances: There is a unique benefit to having two “employers”; although you technically work for the consulting company that employs you, you are ultimately paid by the clients you serve. Each of these parties can curb the excess of the other; an unjustified negative review from your employer can be counterweighted with glowing testimonials from your clients. Having such strong client support will help insulate you from capricious, narrow-minded supervisors who, for one reason or another, are unable to recognize your true talents and potential. There are few professions that offer such a reliable check-and-balance system that can ameliorate unfair and unrepresentative opinions of your job performance.

Every Day is Different: And last, but not least, this job is never boring. Expect to “multi-task” on numerous technical, political, and economic issues on a daily basis. And if you desire to do so, there will be multiple opportunities to write professional papers and articles, participate in the advancement of new investigative and remediation techniques, and be considered as a leader and expert in your chosen discipline and sub-disciplines both within and outside your company.

If, after weighing the aforementioned pros and cons, you have decided to give environmental consulting a try, how can you adequately prepare? My advice would be to initiate the development of the following skills prior to entering this profession:

Proficiency in Geological Description: Despite its emphasis in geological curricula, understanding how sediments and rocks are deposited is unimportant in environmental consulting. What is indispensable is the accurate and consistently uniform description of the physical characteristics of subsurface deposits. Logging soil borings and monitoring wells will likely be your first formative and significant experience in environmental consulting. As such, it will be absolutely essential for you to able to distinguish between closely allied lithologies (e.g., a silty clay versus a clayey silt) and accurately record the plasticity, dry strength, dilatancy, toughness, consistency, and moisture content of samples. As such, you need to be well versed in the Unified Soil Classification System and the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), ASTM D 2488-90. You will also need to know how to take organized and readable field notes. These notes are the foundation of every piece of data generated at a site so start with the Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock, ASTM D 5434-97. And remember, details are what distinguish average field notes from excellent field notes so get accustomed to accurately observing and recording your actions in the field.

Monitoring Well Construction and Testing: It is likely most of you have not installed, developed, or conducted tests on monitoring wells, but this will be one of the most common tasks you will perform upon entering this profession. Familiarize yourself with the techniques specified in the Standard Practice for Design and Installation of Ground Water Monitoring Wells in Granular Aquifers, ASTM D 5092-90, the Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers, ASTM D 5521-94, and the Standard Test Method (Field Procedure) for Instantaneous Change in Head (Slug) Tests for Determining Hydraulic Properties of Aquifers, ASTM D 4044-96. You will also be tasked with the direct supervision of drilling subcontractors; therefore, it will be essential that you are familiar with drilling techniques, particularly hollow stem auger, air hammer, mud rotary, and rotosonic.

Knowledge of Environmental Regulations: Become a student of the environmental regulations applicable in the state or states that you have selected to work in. Fortunately, many state regulatory agencies and the USEPA have created on-line resources that have links to the current controlling regulations so it is no longer necessary to track down paper copies of Federal or State Registers to obtain this information. Knowledge of what work your clients are required to do, the investigative methodologies and sampling frequencies that are required (such as those described in the Technical Requirements for Site Remediation in New Jersey), and how variances that streamline these requirements can be negotiated will make you a very valuable asset to your company and your clients.

Computer Skills: It is likely that you are already proficient in word processing programs such as Microsoft® Word, which is advantageous because you will be given a computer on your first day of employment and you will be expected to know how to use it. Not only will you be typing up your own letters and reports, but you will be managing environmental data using Microsoft® Excel and/or Access. Knowledge of software commonly used to process pump and slug tests results (e.g., Aqtesolv™) and produce report-ready boring logs (e.g., LogPlot™ or gINT®) would be helpful, too.
Preparing Students for the “Real World”

Richard Schultz, CPG-10188

For the second year in a row, Elmhurst College in suburban Chicago, Illinois, has been ranked among the top 10 comprehensive colleges in the Midwest, according to “America’s Best Colleges 2005,” the influential survey by U.S. News & World Report magazine. Elmhurst is the only college in Illinois to appear in the top 10 in this category. One of the reasons for this is that Elmhurst College adequately prepares students for the “real world”.

How is this accomplished? First off, many of the faculty have experience in industry and consulting and can pass along their practical experiences and knowledge to the students. Secondly, graduates and alumni are an extremely important resource for us. We listen to what they have to say about improving our programs and what tools are necessary for our current students to obtain employment.

At a recent Homecoming celebration, a number of returning former students commented on how the Department of Geography and Environmental Planning had prepared them for employment. They cited several instances where faculty had taken the time to apply classroom theory and scientific concepts to real world situations.

Among the comments: (these serve as valuable wisdom for current students in what to be prepared for in the “real world”)

• “Take as much chemistry and computer science applications courses as possible.”
• “Although the hard sciences are most difficult, get as much experience as you can with them, you won’t be sorry later.”
• “Learn GIS!”
• “Attend conferences and conventions as a student and learn what networking is all about.”
• “Practice writing as much as you can. Being a good scientist is all about being a good writer also”.
• “Take it upon yourself to learn about the major “players”, both companies and individuals.”
• “Learn to work well in teams and groups.”
• “While in school, strive for practical experience and obtain an internship.

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• The Right Way to Write: If there is one particular skill where students of geology (and scientists in general) have a weakness, it is writing. My advice would be to write, write, and write, and when you think you are proficient with the written word, you should keep on writing some more. Along with monitoring wells and the construction of remediation systems, the most common deliverable that every environmental consultant generates are written, including reports, correspondence letters to regulatory agencies, and recommendations to buyers and sellers of contaminated properties. The only way you can truly communicate the findings of your investigations or propose solutions to the problems you discover is through the written word. You will need to fully understand the difference between the description, narrative, exposition, instruction, and persuasion writing styles because you will need to utilize each of these methods to some degree in every letter or report that you develop for your clients. Only by practice and effort will you be able to gain a confidence and competence to write well; this is truly a skill that you will work on throughout your entire career.

In summary, it has been my experience that environmental consulting is not for everyone but it can be an ideal job for a select few. Those with a cynical view might say it is an “enabler” job that permits industry to pollute the environment to the maximum extent allowable by law. I would rather view it as a profession that can restore impacted properties to some semblance of their original condition and, as importantly, keep industries from moving to, and ultimately befouling, pristine locations. Remember this, you will come into this job wanting to save the world. You can not, of course, but if you are diligent, resilient, and can weather the slings and arrows of other consultants who seek to undermine your work and effectively manage clients who will resist spending money to correct problems they either bought into or caused themselves, by the end of your career, you may be able to restore a couple hundreds acres of land back to a condition where it no longer poses a threat to human health and the environment. It does not sound like much of an accomplishment for a lifetime of work, but if everybody in this profession aspired to that reasonable goal in this new century, we could achieve a sweeping reversal of the polluting legacy of the last century. Should you chose this profession, I wish you a long and successful career applying your geological skills to this challenging, but rewarding and honorable, work.

John W. Jengo, CPG-08139, is Principal Hydrogeologist for MWH Americas, Inc, in Malvern, Pennsylvania.
Embracing Change

R. Josh Bowers, CPG-07841

In the 1970s there was a steel industry in western Pennsylvania, that was being serviced by a local coal mining industry. My grandfathers, uncles and cousins worked in those industries, and it was a natural assumption, being a geology student at a local university, that I would be going into coal geology. Thirty years later the only trips that I have made into or onto coal mines have been on AIPG or other geology field trips, or as a child riding with my Grandpap's on his “steam shovel”. The view at the beginning of a journey seldom resembles the view down the road. Despite good planning many things that you encounter during your career will be beyond your control. These factors will be the result of changes in national policy and/or economic conditions. The practicing geologist has to keep a wary eye on those changing conditions that may affect his or her career, because like it or not change is part of the business.

To illustrate how change can affect your career, here is a little story. After spending time in western Pennsylvania looking for work that was not there it was time to expand my horizons. Little did I know that three weeks after I hitched a ride with some friends on their way to Texas I would find myself on a chopper headed out to sea. I also found myself working the petroleum business for the next few years. My time in the oilfield was spent as a wellsite geologist (mudlogger) analyzing cuttings brought back to the surface by the drilling mud for petroleum “shows” and trying to predict downhole pressure spikes. I first experienced technological changes while working in the Gulf of Mexico. In college, I punched cards during computer class, and when I used the first Apple portable computers with a monochrome screen to predict downhole pressure spikes it was the start of the new world for me. I am sure that you too will have such epiphanies. All during my career there have been other technologies to be mastered. In 1980 I had never heard of GIS or GPS. That is just a few examples of new technologies that had to be mastered. I am sure there will be other new technologies that will have to be mastered in the future as well.

Embracing Change

There are other disciplines beyond the technical ones that you will have to learn. Few of us have the choice of staying strictly technical. Probably, you will want to be part of the decision making process and that will require you to develop project management, accounting and forecasting skills. Somebody will always think that there is a better way or ways to skip steps that you feel necessary, and if you expect to just perform a job you may be pressured to do things somebody else’s way. Therefore, in order to do the right and ethical thing you almost have to develop your management skills and be part of the decision process, so that you can present your side from a position that will be recognized. Ethics will be an important part of your professional life as your career progresses as will your faith, whatever that may be. Your sense of right and wrong will come into play a lot. Ethics is definitely something that you do not want to leave behind on your professional path. AIPG can help you there as well.

From where I was the eastern coalfields were stagnant in the 1980s, but the oil fields were hopping. There were a few good years to be had before the oil business slowed down, but it happened. Me, being the low guy on the petroleum totem pole saw the change on the horizon, and it was time to get back on the professional trail out of town. By 1983 the oilfield party was coming to an end. So, it was time to stay ahead of the lay-offs and find the next big thing. At the time I had personal reasons for moving to DC, and that led me to my next change and a field I had not considered, the geotechnical field. Washington, D.C. in the late 1980s and 1990s was experiencing a building boom, and that boom required geologists and technicians.

The geotechnical and environmental businesses were the next great things in geology for me. Past experience gained during the oilfield with borehole logging and downhole geophysics came in handy.

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in both geotechnical and environmental pursuits. The difference between petroleum and geo-environmental borings was that the geo-environmental borings were much shorter, and sometimes the attire was a little more constraining than in the oil business. There was a new term that had to be learned “Health and Safety”, which is another career path (believe it or not) that I have seen geologists go down.

Unfortunately, the geo-environmental field was almost too good to be true. This field started to quickly fill up in the 1990s as more and more people started coming over from the oil and mineral businesses. So, one needed an edge. At the time I found geophysics as that edge. It all began when a supervisor was looking for somebody to swing a sledge hammer for him during a seismic survey. Fortunately, that supervisor was willing to show me the geophysical ropes. That little adventure led to learning other geophysical methods, and I was able to use that to stay ahead of the pack. Geophysical projects (jobs) led to hunting underground storage tanks, drums and tracking contaminant plumes. Believe it or not this led to an unexpected professional pursuit that I am still working.

One day an engineer I was working with asked me if I could locate a bomb with the detector that I was using that day. I did not know whether or not that would work, but I said that I would try. Eleven years later, after having performed jobs all over the continental United States, in Hawaii, the Caribbean basin, Europe and Africa, I am still trying to find ways of locating dangerous duds, landmines, and other types of unexploded ordnance (UXO).

Some of the places you go to in your professional travels are not so easy to get to, so expect to spend time in ATVs, four wheel drive pickups and helicopters. You will be doing all kinds of things that you never expected such as eating foods that you never thought you would taste, ordering beers and asking for directions to the bathroom in foreign languages, hailing cabs on a Friday afternoon in New York City. You just can not predict what might happen if you choose to embrace change.

In some ways I envy your adventures to come because with the new technologies come new opportunities and new travels to be encountered. For me, my travels have slowed down with a family and home, but I am finally where I wanted to be when I started studying geology in 1979. I just did not it to be such a convoluted route getting back here to western Pennsylvania. If you had told me everything that was going to transpire back then I would have laughed you out of the room.

So, expect the unexpected and embrace change during your career because you can not predict what will happen in the future, and professionally you can not hold onto the past. You will need to go with the flow, and I just hope that you enjoy the adventure as much as I have, and you have the opportunity to excel in your own way.

I want to leave you with one more thought. Professional recognition for a geologist is something that you will be able to earn through certification in AIPG and registration through your state geology boards. Today, state registrations are more common across the country than not, but that has not been the case. Over the last few decades AIPG has worked tirelessly to get recognition for our profession, but the job is not done. Hopefully, you will not have to explain to colleagues in other professions why geologists require registration, but you probably will since education does not necessarily imply ignorance has taken a ticket out of town. So, if you are confronted with that situation do not back down and take the time to explain the need registration.

You never know where that could lead you. Just getting your foot in the door is half the battle.

• “Become an interdisciplinary expert! Knowing a little about of lot of different areas of study can make you a valuable asset to your employer.”

We, here at Elmhurst College, believe these previous quotes reflect some good advice for current students in what to expect in the “real world” upon graduation.

The Department of Geography and Environmental Planning at Elmhurst College offers two majors: Geography/Environmental Planning and Environmental Management. In addition, a wide variety of cultural-human and regional courses are offered. Students have the opportunity to gain knowledge about both the developing non-Western regions of the world and the modern, industrial Western regions through introductory as well as advanced level regional courses. Specific areas covered in upper division courses include Europe, North America, Latin America, and the Pacific Rim. The topical issues of political, economic, recreation and maritime geography are dealt with through a selection of courses at the 300 and 400 levels. Specifically designed independent study courses on a variety of political geographical topics have also been offered to students upon request. In essence, a concerted effort has been made to create an interdisciplinary program accommodating a wide variety of interests and academic needs.

A new GIS Certification Program has been slated for Fall 2005 to accommodate the increasing demand for spatial analyses and geological applications. Visit the Elmhurst College Department of Geography and Environmental Planning web site at: http://www.elmhurst.edu/~geo.

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Employment and Earnings Trends for Geoscientists and Environmental Scientists

Christopher J. Amick, CPG-08774

Introduction

Geoscientists entering the work force from college or seeking employment within the environmental field have a variety of opportunities and career paths from which to choose. According to the U.S. Department of Labor, Bureau of Labor Statistics (BLS), environmental scientists and geoscientists held approximately 101,000 jobs in 2002, not including those employed by colleges and universities. Of the 101,000 jobs held in 2002, environmental scientists accounted for 65,000 (65%), geoscientists accounted for 28,000 (28%) and hydrologists accounted for 8,000 (8%). The BLS uses the broad term geoscientist to include geologists, geophysicists and oceanographers. Many specialties further differentiate geologists and geophysicists depending on the type of work performed, including the following:

- Petroleum geologists;
- Engineering geologists;
- Mineralogists;
- Paleontologists;
- Stratigraphers;
- Volcanologists;
- Hydrologists;
- Geodesists;
- Seismologists;
- Geomagnetists;
- Paleomagnetists.

A bachelor’s degree is generally adequate for many entry-level jobs, but a master’s degree is commonly the minimum educational requirement for environmental scientists and geoscientists entering the job market. However, a Ph.D. degree is required for most high-level research positions. According to the BLS, employment of geoscientists is expected to experience faster growth than the average for all occupations.

In preparing for a career as a geoscientist, suggested areas of undergraduate focus include hydrology, hydrogeology, hazardous waste management, environmental legislation, chemistry, fluid mechanics, and geologic logging. Computer skills are essential for geoscientists entering the job market, with desired skill sets including modeling, data analysis and integration, digital mapping, remote sensing, and Geographic Information Systems (GIS). Because field work will be expected of many geoscientists entering the job market, prior field experience can be a differentiating factor in hiring decisions. As such, prospective geoscientists should consider summer internships before entering the job market.

Employment

Employment opportunities for geoscientists exist generally in four primary areas:

- Federal, State and local government;
- Private industry;
- Consulting; and
- Self-employment.

Job statistics compiled by the BLS for 2002 indicate that, of the 65,000 jobs held by environmental scientists, approximately 47% of environmental scientists were employed in State and local government, 14% in architectural, engineering and related services, 13% in management, scientific, and technical consulting services, 9% in the Federal government and <1% were self-employed. This distribution of jobs held by environmental scientists in 2002 is illustrated in Chart 1.

Chart 1

2002 Employment Environmental Scientists

www.aipg.org
Job statistics compiled by the BLS for 2002 indicate that, of the 28,000 jobs held by geoscientists in 2002, 30% were employed in architectural, engineering, and related services, 15% worked for oil and gas extraction companies, 12% were employed by State agencies, 11% worked for the Federal government (primarily within the U.S. Department of the Interior, USGS, and DOD), and nearly 3% were self-employed, primarily as consultants to industry or government. The distribution of jobs held by geoscientists in 2002 is illustrated in Chart 2.

Earnings

Median annual earnings of environmental scientists were $47,600 in 2002. The middle 50% of environmental scientists earned between $36,820 and $62,400. The lowest 10% earned less than $29,920 and the highest 10% earned more than $78,200.

Median annual earnings of geoscientists were $67,470 in 2002. The middle 50% of environmental scientists earned between $48,370 and $102,120. The lowest 10% earned less than $36,580 and the highest 10% earned more than $133,310.

Median annual earnings in the industries employing the largest number of environmental scientists in 2002 were as follows:

- Federal government ........... $66,190
- Management, scientific, and technical consulting services ................. $45,560
- Local government ............ $45,270
- Architectural, engineering, and related services ............ $44,590
- State government ........... $44,580

According to the National Association of Colleges and Employers, average beginning annual salary offers for geologists and related fields were as follows:

- B.S. in Geology and related sciences ........... $32,828
- M.S. in Geology and related sciences ........... $47,981
- Ph.D. in Geology and related sciences ........ $61,050

Average 2003 annual salaries for geologists employed by the Federal government in managerial, supervisory, and non-supervisory positions were as follows:

- Geophysicists ............. $86,809
- Oceanographers ........... $79,023
- Geologists ................. $76,389
- Hydrologists ............... $70,525

Summary

Information provided in the Occupational Outlook Handbook, 2004-05 Edition prepared by the U.S. Department of Labor, Bureau of Labor Statistics reveals the following employment and earnings trends for geoscientists and environmental scientists:

- Undergraduates can better prepare for employment with focused, discipline-specific course work and summer internships;
- The greatest percentage of geoscientists are employed in architectural, engineering, and related services;
- Nearly one-half of environmental scientists are employed in State and local government;
- The Federal government offers the best average annual earnings for geoscientists and environmental scientists by a large margin, with roughly equivalent annual earnings offered by consulting, local government, architectural and engineering services and State government; and
- The higher the education attained by geoscientists and environmental scientists, the greater the average annual earnings.


About the author: Christopher J. Amick, PG, LRS, (AIPG Certificate # 8774) is a Regional Manager with KEMRON Environmental Services, Inc., a full service environmental consulting and remediation firm. Mr. Amick holds a B.S. in Geology from West Virginia University, a M.S. in Environmental Science from Marshall University, is a Registered Professional Geologist in Kentucky, and is a Licensed Remediation Specialist under the West Virginia Voluntary Remediation and Program. He is based in Charleston, West Virginia and brings more than 19 years environmental consulting and regulatory experience to bear for a broad range of commercial, industrial, and governmental clients.
SCIENCE IN THE NEWS

From Sigma Xi, The Scientific Research Society

Today's Headlines - December 1, 2004

MOON DANCE ON SATURN'S CANVAS
from BBC News Online

The Cassini space probe has captured an incredible image of Saturn's tiny moon Mimas, suspended against the colourful backdrop of the ringed planet. The image shows Mimas against Saturn's northern hemisphere and the planet's rings (in beige) running across the lower half of the picture. The rings cast delicate shadows across Saturn's northern hemisphere.

http://snipurl.com/b0h4

ANCESTOR'S DNA CODE RECONSTRUCTED
from BBC News Online

Scientists have re-constructed part of the genetic code that would have existed in a common ancestor of placental mammals, including humans. The creature, thought to be a nocturnal shrew-like animal, lived alongside dinosaurs about 75 million years ago. The researchers used computer analysis to compare and contrast modern mammal genomes and then modelled a sequence that would have been common to all.

http://snipurl.com/b0ka

MOUNT ST. HELENS IS WASHINGTON'S NO. 1 AIR POLLUTER
from The Seattle Times

Environmentalists hooted when Ronald Reagan claimed — wrongly — that trees produce more pollution than cars. But right now, the biggest single source of air pollution in Washington isn’t a power plant, pulp mill or anything else created by man. It’s a volcano.

http://snipurl.com/b0h9

N.D. CONSORTIUM WINS NASA RESEARCH JOB
from Associated Press

BISMARCK, N.D. -- NASA has awarded control of its DC-8 research aircraft to the Upper Midwest Space Consortium at the University of North Dakota, a move officials say will create new jobs at the university and give it added national prestige. The plane will be stationed at Grand Forks Air Force Base during a five-year partnership, starting in March, Sen. Byron Dorgan, D-N.D., said Tuesday. “UND now has the opportunity to be part of scientific research on the global scale,” he said, adding that it likely will mean at least a dozen new jobs as well as opportunities for UND students and researchers.

http://snipurl.com/b0k5

SIGN UP TODAY for “Science in the News Weekly,” an e-newsletter produced by Sigma Xi’s Public Understanding of Science program in conjunction with “American Scientist Online.” The newsletter provides a digest of the week’s top stories from “Science in the News,” and includes breaking news and feature stories from each weekend not normally covered by “Science in the News.” To see the current edition:

<http://www.americanscientist.org/template/NewsletterDirect>

AGI Announces New Officers

Alexandria, VA - The American Geological Institute (AGI) welcomes three new officers to the positions of President-Elect, Member-at-Large and Secretary; Dr. Ernest Mancini, Dr. G.W. “Skip” Hobbs, and Dr. Robert H. Fakundiny, respectively.

Dr. Ernest Mancini will serve as President-Elect on the AGI Executive Committee. Mancini, also the 2004 recipient of AGI’s Ian Campbell Medal, is well-known in many sectors of the geosciences including academia, industry and government. He is a professor of Geology at the University of Alabama, an Honorary Member of the Association of American State Geologists and he has made significant contributions to many of AGI’s member societies such as the American Association of Petroleum Geologists, and the Geological Society of America. As a leader and a public servant, his career has centered around three decades of commitment and dedication to the geological profession.

AGI welcomes New York State Geologist Robert H. Fakundiny, CPG-04977 (AIPG 2001 President), serving as Secretary of the Executive Committee. He is currently State Geologist of New York. After receiving his Ph.D. from the University of Texas at Austin in 1970, Fakundiny worked as an adjunct professor at the State University of New York-Albany from 1975-1987 where he pursued his interests in the Adirondack Mountains. His research interests include structural geology and radioactive and toxic waste disposal. He was the recipient of the John T. Galey, Sr., Memorial Public Service Award from the American Institute of Professional Geologists and a fellow with the New York State Academy of Sciences.

G.W. “Skip” Hobbs joins the AGI Executive Committee as Member-at-Large. Hobbs is the founder and managing partner of Ammonite Resources Company, an international petroleum consulting firm headquartered in New Canaan, Conn. Prior to founding the Ammonite Corporation in 1980, and Ammonite Resources in 1982, Hobbs was employed by Amerada Hess Corporation, International Division, New York from 1977-1980; and by Texaco, Inc. in Ecuador, Great Britain, Indonesia and Portugal from 1970-1977. In 1996 he was presented with the Distinguished Service Award of the American Association of Petroleum Geologists (AAPG) and has been the AAPG representative with AGI advisory board.
AIPG 2004 Annual Meeting in Review

Bob Stewart, CPG-08332

NE-AIPG began planning in earnest for the 2004 annual meeting in 2001. Within about a year we had decided on Saratoga Springs and the Gideon Putnam Hotel as our host venue, while concurrently building a general model for the meeting, embracing AIPG business meetings and professional events, technical sessions, field trips, short courses, and plenty of time for socializing at the icebreaker, awards banquet, and a dinner cruise. Although we were confident that our event would be successful as the planning proceeded, there was a collective deep breath among the organizing committee as we finalized the program and published the registration materials and fees during the summer of 2004. Within a month we knew we had a winner, with strong local support, and a final attendance of over 250 registrants for various events. The 2004 meeting was also the inaugural event for AIPG’s upgraded website and online registration, which allowed us to track the registrations for each event.

The fall colors were just beginning to peak, and the weather was perfect for the field trips. Within 10 minutes of the hotel were the exceptional geysers of Saratoga Springs and the unique stromatolites of Petrified Forest. Further afield we visited the famous deposits of gemstones and iron-titanium in the Adirondack Mountains; slate, marble, and talc mines in Vermont; karst geology at Howe’s Cave; the world famous Paleozoic stratigraphy at Thacher State Park; and a wine tour of local vineyards. Many of our participants enjoyed the once-in-a-lifetime opportunity to view one of the New York City water supply tunnels, drilled with a tunnel boring machine through Precambrian metamorphic rocks hundreds of feet below Manhattan.

The Gideon Putnam Hotel was an excellent host, providing a splendid array of food and drink for our icebreaker, the coffee breaks during technical sessions and short courses, and the awards banquet. The dinner cruise on Lake George was accompanied by great views of the lake, a beautiful sunset, a sumptuous buffet, and a clear, starry night.

The technical sessions began with an overview of New England geology by Jim Skahan (CGP-01505), and continued with presentations dealing with self-marketing for geologists, aggregate resources, brownfields redevelopment, environmental investigations, and remediation techniques.

Our short courses saw strong attendance and were well-received, judging by the evaluation forms. The first morning of the monitored natural attenuation course was particularly electrifying, as 30+ participants tuned on their laptop computers at once, tripping a circuit breaker. Gideon Putnam staff quickly remedied the problem, the course proceeded without further incident, and participants learned to use a software package developed by the presenters. Our other short courses dealing with environmental geophysics and circulation well technology were also well-received. Course participants earned CEUs for various license programs including professional geologist, licensed environmental professional (LEP), and licensed site professional (LSP).

On behalf of the Northeast Section, thanks to all who attended and made the 2004 annual meeting an overwhelming success!

AIPG 2004 Annual Meeting Abstracts

Aggregate Resource Development and Extraction

Richard Fox
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The quarrying of aggregates has always been the ‘Cinderella’ of the mining industry with little to attract the public despite the fact that it is now the biggest sector of the mining world in the UK in terms of production with some 200+ million tonnes sold annually. It mostly suffers from a ‘bad press’ and is a popular target when any application is made for new development of sites whether it is extensions to existing workings or new ‘greenfield projects’.

Local County Authorities are now obliged to maintain supplies of aggregates to meet the needs of the local markets. Although the ‘Aggregate Levy’ introduced in 2002 has encouraged the use of recycled material for some construction projects there is still a steady demand for the workings of sand and gravels, limestones and granites to be maintained to meet that demand.

The restoration of many quarries are now hailed as much needed nature reserves, fishing lakes, and other leisure activities such as sailing and rowing, and in many cases sites are reclaimed for agriculture, forestry or even industrial purposes.

Increased legislation relating to the environment at both the European and National level has resulted in a corresponding increase in costs in order to comply with the many regulations. Various constraints such as ecology, hydrogeology, and archaeology have become major difficulties to be overcome (as well as being costly) with any aggregate development. These are now common obstacles in the developed world with the quarrying industry having to address these matters in Europe, N. America, Australia etc where the public carefully scrutinize any form of development that results in a change of use.

The quarrying industry has nevertheless much to be proud of, and their response to the difficulties of a fluctuating market and increased opposition often on international basis says much of the expertise now available in the industry to achieve the successes that they do.

Treatment of Contaminated Groundwater Using NanoFe™ Technology

Harch S. Gill, Ph.D., and Kaiti Liao,
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NanoFe™ Technology is an innovative remediation technology for treating a wide range of recalcitrant contaminants. NanoFe consists of supported submicron (<10-6 meter), bacteria-sized particles of zero valent iron (Fe0) and trace amounts of a noble metal catalyst. NanoFe is an extremely versatile remediation tool given its high activity and extremely small particle size (typical particle sizes are on the order of 10-100 nanometers). NanoFe can effect the rapid destruction of a wide range of recalcitrant contaminants on either an in-situ or ex-situ basis. In the in-situ application, a slurry mixture of NanoFe and water is injected under pressure or by gravity into the contaminant plume. These particles have good flow characteristics and remain in suspension over extended periods of time to flow with the groundwater, while offering high reactivity that can dechlorinate chlorinated hydrocarbon contaminants.

NanoFe™ Technology has been applied at several sites to treat groundwater contaminated with a variety of chlorinated hydrocarbons. The injected NanoFe significantly reduces the concentrations of chlorinated contaminants within approximately three days. Additionally, the injected NanoFe produced reducing conditions that fostered continuing natural attenuation of contaminants. This paper presents the results from several field applications and evaluates the distribution and effectiveness of the NanoFe.
Enhanced bioremediation is a useful groundwater technology for many sites containing petroleum hydrocarbons where source removal has occurred, but residual petroleum hydrocarbon concentrations in groundwater are still too high for site closure. Although enhanced aerobic bioremediation is a slow process, it can significantly reduce site closure schedules from decades for natural attenuation in an anaerobic environment to a few years with the addition of dissolved oxygen. Several passive and semi-passive oxygen delivery systems have been developed over the past decade. The ISO-1 gas diffusion system works in wells as small as 2-inch diameter and has been used on over 250 sites. The gas diffusion system allows for oxygen to dissolve slowly at about 15 cc/min or 0.77 cubic feet per day per monitoring well.

For in-situ enhanced bioremediation of petroleum hydrocarbons, direct contaminant concentrations are useful to evaluate the success of the project. However, as water levels change over the complete hydrologic cycle, other indirect indicators provide confirmation data for microbial activity and geochemical conditions. Indirect indicators include dissolved oxygen, heterotrophic plate count, specific aerobic degraders, macronutrients ammonia nitrogen and ortho-phosphate, total inorganic carbon, total dissolved solids, speciated alkalinity, pH, oxygen reduction potential, chemical oxygen demand (COD) and biological oxygen demand (BOD), ferrous iron, sulfate and nitrate. A gas infusion case study using the iSOC technology from Maple Shade, New Jersey was evaluated for indirect indicators, which verify that enhanced bioremediation was responsible for hydrocarbon degradation (benzene > 96%, MTBE = 89% and TBA = 54%) that occurred over a 6-month period. In this case, an average of 221.6% increase in total inorganic carbon between pre-treatment and post-treatment samples in 9 wells shows the degradation was related to the iSOC treatment, and not related to seasonal changes in the hydrologic contaminant cycle.

For in-situ enhanced aerobic bioremediation of petroleum hydrocarbons, providing dissolved oxygen in the groundwater is necessary prior to significant contaminant degradation. Nonetheless, measuring dissolved oxygen has always been problematic and a potentially major source of error. A former gasoline underground storage tank case study from northern California is reviewed in detail. Pre-treatment levels of dissolved oxygen ranged from 4.10 mg/l to 5.76 mg/l in the central core of the hydrocarbon plume (8,400 to 23,000 mg/lTPh-Hg and 5.61 to 6.04 mg/l in the wells without a reportable concentration of TPh-Hg or BTEX compounds. The evaluation relied on a variety of indirect indicators in combination to obtain a clear understanding of the subsurface conditions. Based on a combination of indirect indicators, the dissolved oxygen data were questioned and the original interpretation was completely reversed, changing the course of remediation from monitored natural attenuation to a planned enhanced bioremediation program using an iSOC system. Careful evaluation of the indirect indicators can provide valuable information on in-situ enhanced bioremediation projects.
Pressure groups, restoration through serendipity, the need to think objectively of phased restoration, the acceptance of restoration by the need to achieve a ‘green’ landscape, speed in restoration, the increase in the UK today and refer to issues such as afteruse, the perceived habitat.

Extensive research has been undertaken to identify successful care conditions applied by statute which are subject to review. Problems. All mineral permissions now have restoration and after-use effective restoration provisions. In addition, the project will support an eventual ROD for ST12 (Waikakalua FSA) by preparing closure plans for the contamination source area currently being treated using bioventing. The ROD may include SSPRG’s as a key component of the final remedy for petroleum hydrocarbons released to the subsurface.


Restoration is a key feature of nationwide planning control of mineral extraction in the UK. The original objective was initially to bring land back into agricultural use. The success of this was uneven and the agricultural imperative has become a negative process. Restoration failed for financial or technical reasons but also due to haste, lack of management and over elaborate restoration controls applied by planning authorities. In addition, many early planning permissions and many old ‘grandfather’ operations had no effective restoration provisions.

Over the last 20 years steps have been taken to resolve these problems. All mineral permissions now have restoration and aftercare conditions applied by statute which are subject to review. Extensive research has been undertaken to identify successful restoration procedures. Finally, the general agricultural imperative has changed such that only the best land is restored to agriculture with other land now frequently being restored to forestry or wildlife habitat.

The paper will review this background in relation to the process in the UK today and refer to issues such as afteruse, the perceived need to achieve a ‘green’ landscape, speed in restoration, the objective of phased restoration, the acceptance of restoration by pressure groups, restoration through serendipity, the need to think big in future restoration, enforcement and the spurious accuracy of some planning conditions, bonding and the need not to reinvent the wheel every decade.

Water Quality Mixing Analysis Using a Hilbert Space Setting TV. Homadka II, Ph.D., Professor of Mathematics, Geological Sciences, and Environmental Studies mjl@homadka.net

C.C. Yen, Ph.D. Senior Scientist Tetra Tech (949) 253-2958

A common problem that occurs in the analysis of water quality is the relative proportions of considered constituents found in surface water or groundwater. This problem occurs when analyzing groundwater with respect to the source of pollution observed in sampling data over time. For example, if one or more sources of pollution is under scrutiny, and there are sampling data for each of the sources, chemical “fingerprints” can sometimes be determined at the source locations which then can be used to resolve sampling data at the point of interest into the proportions of contribution from the suspected sources. A method to accomplish the apportionment of source contribution is to utilize Hilbert space setting where the determined chemical fingerprints are the basis vectors of a Hilbert space with the inner product defined to be the usual vector dot product. The procedure is readily programmable and can be efficiently executed on a spreadsheet program for large quantities of sampling data. To demonstrate the procedure a case study is examined involving 214 samplings and 26 wells.

Applied Geology and Geophysics in the Widening of New Hampshire’s Interstate 93 Michael O’Brien Department of Earth Sciences University of New Hampshire mjobrien@csunix.unh.edu

Interstate 93 (I-93) is an important road corridor in the Northeast, connecting Boston, Massachusetts and many cities in NH. In New Hampshire, I-93 stretches from the border of New Hampshire and Vermont in Littleton NH to the Massachusetts bordering town of Salem NH. The original interstate was built in the 1960’s and was designed for a maximum volume of 60 to 70 thousand vehicles per day. The department of Transportation (DOT) in NH found that in 1997 there was an average of 105,000 vehicles traveling per day on the section of I-93 in Salem, with 60,000 – 80,000 vehicles traveling per day through segments north of Exit 1 in Salem. DOT traffic projections revealed that by 2020, 140,000 vehicles per day will travel or pass through the already very congested and dangerous stretch of I-93 in Salem.

The state of NH put forth plans to build two more lanes both north and south bound on I-93 from the border of NH and MA in Salem to the I-93/I-293 intersection in Manchester NH. The project is projected for a full 18 miles of interstate and will take ten years to build at an approximate cost of $420 million dollars.

The Engineering/Geology section of the DOT will play a large role in its planning. Before the expansion of I-93 can take place a great deal of preliminary geological data must be collected. To build a road properly, engineers and construction companies need to gather critical geologic data including the type of soil and depth to bedrock.

This poster reviews several important data collection steps needed for making informed decisions on the amount and type of material to be removed during the road’s construction. All of the data and information was collected along Rt. 111 near Exit 3, I-93 and along the southbound off-ramp of Exit 3 in Windham NH.

Waterloo Profiler, Membrane Interface Probe, Onsite Labs and the Triad Approach Seth Pitkin and Mike Rossi Stone Environmental, Inc. spitkin@stone-env.com

The Triad approach to site investigation results in lower costs, shorter investigations and better decision-making about remedial options. The Triad approach can be altered in progress in response to evaluation of real-time data as they are produced. The three legs of the Triad are: 1) systematic planning; 2) dynamic work plans; and 3) real-time measurement technologies.

Real-time measurement technologies include (1) the Waterloo Profiler, (2) the membrane interface probe (MIP) for rapid screening of stratigraphy and VOC distribution, and (3) onsite analytical laboratories using solid phase microextraction (SPME). The Waterloo Profiler provides high quality solute concentration data along with a continuous real-time record of the index of hydraulic conductivity, rate of penetration, hydraulic head, specific conductance, pH, dissolved oxygen, and oxidation/reduction potential. The MIP is a relatively new direct-push tool using electrical conductance
Introduction to Northeastern Geology
J. W. Skehan, S.J.
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Characteristic elements of the northeastern Appalachian orogen are described in a plate tectonic context involving the assembly and breakup of three supercontinents, Rodinia, Gondwanaland, and Pangaea. The eastern margin of North America is considered to be part of the evolving Laurentian craton. The eastern half of the orogen is interpreted to have been part of Gondwanaland or southern terranes that have been sutured to eastern Laurentia by collision tectonics. The evolution of the present bedrock geology is described by skehan in ROADSIDE GEOLOGY OF MASSACHUSETTS (2001) and ROADSIDE GEOLOGY OF CONNECTICUT AND RHODE ISLAND (in preparation).

Citation for Willard P. Fuller, J. r., CPG-1680
2004 Recipient of the Award of AIPG Honorary Membership
James F. Davis, CPG-833, Citationist

I am gratified to have this opportunity to present the AIPG citation on behalf of Willard P. Fuller to receive the Honorary Membership Award in 2004. I have known Bill for over 26 years and as California State Geologist worked with him closely when he served as a prominent member of the State of California Mining and Geology Board. The Board is composed of gubernatorial appointees with staggered terms who administer certain of the mining regulations in the state and provide policy guidance on technical matters to the State Geologist and the Department of Conservation. Bill is a role model for provision of capable professional service to his employers, contributing time and knowledge in public service, serving our country during war, and overcoming physical health challenges. This citation is an outline of the exemplary contributions he has made to his profession and to society.

Bill was born in Cambridge, Massachusetts which still is evident in his pleasant eastern Massachusetts twang. Nevertheless, he is an urbane well-traveled individual with extensive professional experience in many parts of our country, particularly in the West. He became interested in geology in his junior year in high school during a summer trip with the geologist of Atlantic Gypsum Products Company, which his father founded and managed, looking for mineral resources in Cape Breton, Newfoundland and Labrador.

At Harvard, Bill benefited from the courses taught by such professional giants as Kirtley Mather, Reginald Daly, and Louis Graton. He served one summer as field assistant to the legendary structural geologist Marland Billings in the President’s Range of New Hampshire and attended the University of Wyoming field camp in eastern Wyoming.

He undertook a Masters Degree program at California Institute of Technology in 1940 and 1941 where he further benefited from course work with prominent geologists and geophysicists including Horace Fraser, Ian Campbell and Charles Richter. His MA thesis was a pioneering look at trace metals associated with gold using spectrometry in the Alleghany district of the Mother Lode in California. Bill also met and became engaged to his wife, Vera, who was on the support staff at CIT.

Bill began work as a geologist on the Basic Magnesium defense project operated by Anaconda Mining Company at the magnesite quarry at Gabbs Valley, Nevada. Bill then served for two years as the communications officer on a US Navy anti-submarine patrol craft operating in the Mariana Islands.

Following his return to civilian life in 1946, Bill worked for Anaconda at the Tintic silver-lead district in Utah where he served as assistant to the resident geologist. A short time later he became the lead geologist conducting surface and subsurface mapping and overseeing the company’s block leasing program in the area. Bill was hired away from the
Tintic district to become the geologist at the Sixteen to One Mine in the Alleghany gold district of California. A new chapter of Bill's life began in 1952 when he contracted polio and spent many months in the hospital recuperating and having to learn to walk again. Although he eventually regained the capability of going underground again, Bill changed employment to the Calaveras Cement Company that operated a quarry and plant in the foothills of the Sierra Nevada at San Andreas, California. At that time the company was nearing the end of its cement rock proven reserves. Bill was very successful in his exploration efforts and the operation did not have to seek an additional production site for 17 years, until 1971. During his association with Calaveras Cement, it became the "cash cow" division of the Flintkote Company which acquired Calaveras and eventually Genstar which took over Flintkote. Bill expanded his industrial minerals exploration activities to other properties owned by the acquiring firms in Ohio, Kentucky, Nevada, Arizona, Utah, and New York.

Bill retired in 1983 and still lives in San Andreas with his wife. Their two daughters and their families live nearby and his son lives in the Chicago metropolitan area. Bill feels his greatest professional satisfaction has come from his successful efforts at keeping his various employers optimally supplied with additional proven reserves at their preferred operating locations. He is also gratified by the personal relationships that he maintained with the managers and staffs of these companies.

Bill has made many important contributions to society. Among them, he attended a number of associates successfully supported the candidacy of his long time friend, Ian Campbell to become California State Geologist in 1959. Bill has always enjoyed participation in the activities of regional and local sections of professional societies including AIPG and SME. He has also served as geologist in a number of public service roles. Among these, he value his well-regarded efforts as a member of the State Mining and Geology Board. He provided crucial guidance to the Board's development of the regulations that were created to implement the precedent-setting Surface Mining and Reclamation Act of 1975. His leadership and insights came at a time at which they were vital. He was also a key member of the search committee of the Board that nominated me as California State Geologist, a position in which I served for 25 years, before my retirement in 2003. I greatly value my interactions with him in many ways such as the beginning of implementation of the Surface Mining and Reclamation Act. Bill's contributions to the California Geological Survey during his service as a Board member have been monumental in many ways.

Since retirement, Bill has continued to generously share his geologic insights in a variety of other ways through his local consulting work as well as teaching a course sponsored at the Columbia Junior College for 15 years. He continues to be a member of the Calaveras County Historical Society and has led efforts to husband the marvelous historical heritage of this fabled mining region. Bill and professor Limbaugh have published "Calaveras Gold" detailing Calaveras County's mining history. Bill continues to work on "Alleghany Gold" which he looks forward to publishing.

For all of these role model accomplishments, I submit this citation of Bill Fuller to be awarded Honorary Membership of AIPG in 2004!

James F. Davis, CPG-833, Citationist

Response

It is with much pleasure that I accept the AIPG 2004 Honorary Membership Award but I am indeed sorry that the condition of my health prevents me from coming east to receive it in person.

I am proud of my membership in the AIPG of nearly four decades. There was a real need for the Institute when I joined, and today there is still much that the Institute can do, especially with our younger members seeking to establish themselves. TPG continues to be one of the best professional journals, always with timely and interesting articles, and so useful in keeping us up-to-date in AIPG activities and in our profession.

I consider the most satisfying and rewarding part of my career to be the twenty years working as a staff geologist with The Flintkote Company, then a major multi-plant corporation in the building materials industry, in recording raw material reserves, developing additional reserves to replace those used up, as well as those needed to expand or to extend the life of individual operations, or to find and develop new deposits. In hand with this went quarry and mine design to maintain or improve costs, safety, and other concerns. We had operations in a number of different states including those in cement, lime, dolomite, gypsum, and aggregates. Each of these was unique in its geologic, mining, and environmental characteristics, providing a wide variation in otherwise repetitive procedures. One of the operations I particularly liked to visit was Glens Falls Cement right here in upper New York state.

A professional geologist may be called upon to assist governmental and other agencies when his experience and knowledge might be helpful. My major contribution involved appointment to two terms on the California Mining and Geology Board, reconstituted in 1975 to carry out the mandates of the Mine Reclamation Act of that year. Our Board helped California to become one of the leading states in establishing a mine reclamation program.

Although my only serious teaching had been the two years I was at Caltech as a teaching fellow; I was called upon in the mid-70s to help set up an extension course and be the lecturer in geology in the Mother Lode region on the western flank of the Sierra Nevada — a truly fine area for such a course. The success of this venture, which lasted some 15 years, was very rewarding, especially in seeing how much members of the public were interested in the subject, and how responsive they were to our lectures and field trips.

Like many of us, I became involved in consulting, particularly in the latter part of my career. It is surprising what a wide range of activities a geologist can be asked to help. From such mundane subjects as groundwater supply and crushed rock and aggregate operations to a great variety of prospecting ventures. More recent consulting has been primarily with environmental studies and historical resumes mostly leading to preparation of EIRs and similar reports.

Always interested in history, especially local and regional, my declining mobility and energy levels have caused me to concentrate my activities in this direction. A longtime member of the county historical society, I have found this a fertile field of endeavor.

In conclusion, although geology has been the mainstay of my career, the great variety of directions in which it has led is what has made it a most worthwhile profession to me and I am sure to many others. And I think all of us can thank the AIPG for its help in guiding us along the way. For this and for tonight's award I am most grateful.

William P. Fuller, J r., CPG-01680
noted that are successfully treating over 750 million gallons of mine drainage each year. These systems are removing over 200 tons of metals and neutralizing over 335 tons of acidity annually from the Slippery Rock Creek Watershed, a public water supply. In addition, about 200 acres of abandoned mine lands have been reclaimed to productive farms or wildlife habitat, while over 10 acres of wetlands have been created. These efforts have resulted in an amazing improvement in 11 miles of stream and the observation of fish in six miles of stream, probably for the first time in over a century.

Margaret has also been focused on providing education outreach opportunities to all who are interested in watershed restoration and passive treatment systems design, and environmental improvement. She encourages private industry, governmental agencies, environmentalists, and educators to set aside their differences, find common ground, and work together in one concerted effort to restore watersheds. Margaret has also served as an expert witness in court cases and has provided testimony before the US House Subcommittee on Energy and Mineral Resources regarding the Abandoned Mine Land Fund.

Few people have the drive, will, and determination to not only dedicate their lives to a vision, but also to achieve it without monetary or political gain. Margaret Dunn, however, is one such person who strives to make a positive impact upon the world around her and to help others do the same. Margaret is a role model and an inspiration to those involved in stream ecological restoration. Her motto "Get It Done!" is the epitome of her character and her achievements are the testimony to validate it. Congratulations on receiving this well-deserved award from AIPG.

Citation for
Margaret H. Dunn, CPG-7341
2004 Recipient of the
AIPG J ohn T. Galey, Sr.
Memorial Public Service Award
Cliff Denholm, Citationist

It is with great honor and pleasure that I provide this citation for Margaret H. Dunn, recipient of the 2004 John T. Galey, Sr. Memorial Public Service Award. Margaret has been a leader and mentor in the development, implementation, and evaluation of abandoned mine reclamation, passive treatment systems, and watershed restoration. Her relentless energy, selflessness, constant drive and perseverance to "Get It Done!" while involving young people to provide them with invaluable experiences and opportunities are just some of the many qualities that make her an exceptional human being and deserving of this award.

Margaret has worked with the coal mining industry for over twenty-five years providing geologic services and addressing water quality issues. She is currently co-owner and president of BioMost Inc., a small consulting company and is the founder and president of Stream Restoration Incorporated, a non-profit organization involved in the restoration of watersheds. Margaret is also currently president of the American Society of Mining and Reclamation.

Margaret realized that her experiences and knowledge gained through working with the mining industry could be beneficially used to restore watersheds impacted by pre-SMCRA mining. In 1992, she co-founded the J ennings Water Quality Improvement Coalition, which addressed polluted drainage from an abandoned drift mine at the Jennings Environmental Education Center in Butler County, PA.

Motivated by their success, Margaret and a handful of individuals from private industry, schools, governmental agencies, and local citizens formed the Slippery Rock Watershed Coalition (SRWC). Since 1994, the SRWC has constructed 15 passive treatment systems and a handful of individuals from private industry, schools, governmental agencies, and local citizens formed the Slippery Rock Watershed Coalition (SRWC). Since 1994, the SRWC has constructed 15 passive treatment systems and the value of public-private partnership efforts for environmental improvement. She encourages private industry, governmental agencies, environmentalists, and educators to set aside their differences, find common ground, and work together in one concerted effort to restore watersheds. Margaret has also served as an expert witness in court cases and has provided testimony before the US House Subcommittee on Energy and Mineral Resources regarding the Abandoned Mine Land Fund.

Few people have the drive, will, and determination to not only dedicate their lives to a vision, but also to achieve it without monetary or political gain. Margaret Dunn, however, is one such person who strives to make a positive impact upon the world around her and to help others do the same. Margaret is a role model and an inspiration to those involved in stream ecological restoration. Her motto "Get It Done!" is the epitome of her character and her achievements are the testimony to validate it. Congratulations on receiving this well-deserved award from AIPG.

Cliff Denholm, Citationist

Response

Becoming a geologist was one of my best life decisions. This profession has enabled me to contribute to the restoration of mining-impacted watersheds by partnering with community service groups, volunteers, students, regulatory agencies, and the mining industry. These positive working relationships have enabled fast-paced and dramatic results. For example, passive treatment systems with innovative components have been designed and built in weeks not months or years. As the Citationist Cliff Denholm stated, within the Slippery Rock Creek Watershed (Ohio River Basin) near Pittsburgh, PA, fifteen such systems have been installed in less than a decade to treat a combined total of over 750 million gallons of mine drainage annually with fish returning in 11 miles of stream probably for the first time in over a century. With these successes, our outreach effort has expanded to include the installation of over a dozen additional systems with local partnerships in other watersheds with equally gratifying results. Based on my experience, no one person, group, agency, or industry has the ability or the resources to successfully tackle these extensive environmental issues alone. Without the ongoing support of the following groups, this work would not have been accomplished: Western PA Watershed Program; Dominion Foundation; PA Dept. of Environmental Protection; Jennings Environmental Education Center; Butler Co. Commissioners; Quality Aggregates; Grove City College; Environmentally Innovative Solutions, LLC; WOPEC; Aquascape; Beran Environmental; BioMost, Inc.; Stream Restoration Inc.; and many others.

The potential for future contributions appears limitless. Many of us realize that professional geologists are uniquely qualified to balance economic and environmental considerations relating to resource extraction. By recognizing the interaction of biological, chemical, and physical processes, AIPG members are poised to tackle future demands relating not only to resource exploration and evaluation but also to development of mining and post-mining plans that sustain land productivity and the community.

After attending the 2004 AIPG meeting, I was inspired and even more convinced of the expanding value of the professional geologist. Your encouragement was energizing. My appreciation cannot be adequately expressed for the 2004 John T. Galey, Sr., Public Service Award. Thank you!!

Margaret Dunn, CPG-07341
Citation for
Robert H. Fakundiny, CPG-4977
2004 Recipient of the
AIPG Martin Van Couvering
Memorial Award
Robert A. Levich, CPG-6477, Citationist

During 1963-1965, Martin Van Couvering served as AIPG's first President and devoted himself to establish the Institute on a solid foundation, by making the Presidency a full time occupation. His name is synonymous with dedication and service to AIPG and the effort to strengthen the geological sciences as a profession.

Dr. Robert H. Fakundiny, the 2004 Recipient of the Martin Van Couvering Memorial Award, has followed in Van Couvering's footsteps and has distinguished himself for service to the Institute and to the Geologic Profession. "Fak" is one our best-known professional peers, and has earned our respect as a scientist, a friend, and a human being. As his colleague and friend for more than 40 years, I am both deeply and sincerely honored to serve as Bob's Citationist.

Fak was awarded a Bachelor's from the University of California at Riverside in 1962, and in 1963 volunteered for the US Peace Corps. Assigned to Ghana, West Africa, he mapped Precambrian metamorphic and intrusive rocks for the Ghana Geological Survey; studies that evolved into a Master's degree at The University of Texas at Austin in 1967. In 1970, the University of Texas awarded him a Doctorate for his dissertation on structure and stratigraphy of central Honduras.

Fakundiny joined the New York State Geological Survey in 1971 and was appointed State Geologist and Chief in 1978, a position he held for 25 years, exceeded only by the legendary James Hall. He has served as adjunct professor at the State University of New York at Albany, and consulted for Dow Chemical Corporation and Los Alamos National Laboratory.

Bob has served as AIPG's National President, National Secretary, and Chair of the National Screening Board and the National Affairs Committee. He is the incoming Secretary of the American Geologic Institute. Fak is a Fellow of the Geological Society of America, incoming Chair of GSA's Engineering Geology Division, and a member of GSA's Joint Technical Program and Professional Development Committees. He is also a Fellow of the Geological Association of Canada, Geological Society (London), New York Academy of Sciences, and the American Association for the Advancement of Science, and is a member of 20 other local, national, and international geologic societies.

Bob has been President of the Association of American State Geologists (AASG), Chair of the North American Commission on Stratigraphic Nomenclature, and Executive Director of the New York State Technical Advisory Committee on Seismic Hazards. He was the first Chair of GSA's Northeastern Section Public Policy Committee, Chair of the Ian Campbell Award Committee, served on the AASG committee that framed the National Cooperative Geologic Mapping Act that has provided more than $250 million for geologic mapping, and chaired the AASG Committee that reviewed the USGS National Radon in Cellars Study. Fak has been a member of more than 80 advisory boards and task forces for State and Federal agencies. He is on the editorial boards of three scientific and professional journals.

Fakundiny has authored ca. 200 scientific papers, reports, abstracts, articles, and reviews on structure and tectonics of New York State, geology of the Adirondack Mountains, landslides, mineral resources, land-use planning and siting nuclear facilities. His current research projects are in the Adirondack Mountains, and on a giant rock-block landslide south of Syracuse. He was principal editor of a special volume of Tectonophysics: Neotectonics and Seismicity of the Eastern Great Lakes Basin, and co-edited the AGU textbook: Earth Science in the City: A Reader.

Bob is a highly talented geoscientist, who has dedicated himself to improving the practice of geology, both as a scientist and an administrator. His ethics and professionalism are beyond reproach, and serve as a model for others to emulate. He is a great colleague, a wonderful friend, and is the very essence of the legacy of Martin Van Couvering.

Response
Members, honored awardees, and ladies and gentlemen, thank you for this tremendous award. Thank you Robert Levich for the citation, and William Siok for reading it in Bob's place. I did not have the privilege of knowing Martin Van Couvering, but I have heard much about him from those pioneering members that started the Institute with him. He is revered for his devotion to the Institute and his hard work for it, and through those efforts he has become the role model for service to the profession of geology. I accept this award with dumbfoundment and with humbleness that the Institute has added my name to the list of earlier awardees. That list, as you know, comprises the leaders of the Institute and our profession from the time the award was established. The award itself is not so important, but rather the message it sends forth to our younger colleagues—that service to the profession and to its societies is one of the cornerstones of professionalism. I hope that I can continue to be useful to the American Institute of Professional Geologists and our sister societies for a long time to come. Thank you again for this surprised salutation.

Robert H. Fakundiny, CPG-04977
Citationist
Tom Fails is a successful petroleum geologist. He began his distinguished career with Shell Oil Company after receiving degrees from Colorado School of Mines and Columbia University. During his eleven years with Shell, he drilled three successful discoveries in the Gulf of Mexico (one where his predecessors had not had success.) He has always been generous at providing assistance to his geologic colleagues and, in 1995, Tom, along with two coauthors, published a book on exploration and exploitation of diapiric structures in the Coastal Salt Basin of Louisiana and Texas. In 1967, Tom joined Trend Exploration in New Orleans but two years later, he was thrust into international exploration when the company moved him to London. It was there that he fully developed as an explorationist and learned how to be a successful, independent oil man. He continues to explore for oil and natural gas in the Gulf of Mexico and on several other continents.

Tom was active in professional and technical organizations from the beginning of his career. He began a distinguished record of service to AIGP in 1990. Initially, Tom's international interests spurred him to join the AIGP-sponsored People to People trip to the Soviet Union. We had hooked him and he has been a prizecatch for the Institute since that initial experience. He began his first committee service to the Colorado Section in 1991. At that time, Tom and I had been appointed by the Governor to serve on the Colorado Geological Survey Advisory Committee.

His interest in political activism through the section initially focused on working toward a strong and well-run state geological survey. In 1993, Tom chaired the first Colorado Section AIGP Legislative Reception, a very successful event that continued this year with the 11th Annual Reception. He also conceived and was chair of the first Colorado Section AIGP Front Range Collegiate Geology Student Day hosted by Colorado School of Mines in 1996. He has served five terms on the Section Executive Committee.

In 1995, Tom was Vice President of AIGP and served on the Ad hoc Committee for By-Laws and Policies Review for AIGP National. Three years later he was elected National President-Elect and served as President in 1999. He has worked to improve communication between National and Sections, improve our Annual Meetings, expand our relationships with international organizations, and to conceptualize and, with others, design a Continuing Professional Development program for AIGP. He chaired the Task Force on Continuing Professional Development from 1997 through 2002, with the program adopted in 2002. In recognition of his tireless efforts for the Institute, Tom was awarded the Martin Van Couvering Memorial Award in 2001. Not one to rest on his laurels, Tom co-chaired the 2003 Annual Meeting in Glenwood Springs, Colorado. As his co-chair, it was my good fortune to work with Tom on a very successful (and fun) meeting. I will cherish the planning lunches we had in advance of the meeting. The lessons in exploration and stories about international adventures have been an added benefit to our friendship.

Tom has traveled far in the years since his birth in Ohio. He has grown even stronger since his days in the Marines. Oil and natural gas continue to have little success in eluding his search, although Tom would quickly admit to having drilled more than a few dry holes along the way. But most important, the profession of geology continues to benefit from his tireless service to the Institute; his surveillance of government actions affecting our community; and his ongoing activities in local, national, and international geological affairs. I am honored to call Tom Fails my friend and colleague.

Susan M. Landon, CPG-4591 Citationist
what was left of my GI Bill educational rights. Shell had financed my 1955 the-
sis field work in Nevada, and hired me
full-time when my Masters degree was
assured. After 14 months in the Shell
Training Program I was assigned to the
Marine Exploration Group in New
Orleans, to work in the offshore area.
This was the beginning of a wonderful
career.

The efforts of petroleum geologists in
the US and internationally are now
increasingly important. Most of you are
probably from the northeastern US, and
have little or no contact with real, live
petroleum geologists like Susan and I.
What follows are the current views of
many American petroleum geologists.
Our industry has seen numerous cycles
of boom and bust, with periodic cries of
“we are running out of oil.” But this time
it is different. - oil is now in great
demand but in short supply, with little
easily accessible exploration potential
outside of the Mid-East, the Caspian,
Russia and offshore West Africa. Here at
home, we produce only about 36% of our
consumption. This decline will continue
as imports increasingly replace domes-
tic oil. Imported oil is now the largest
component in our trade deficit, a major
economic problem for the US.

With natural gas, the US is much bet-
ter off. Predictions for 2004 gas supplies
are for a bit over 20 TCF to be produced
domestically, which is 83% of consump-
tion. Nearly 4 TCF or 17% of consump-
tion is imported, mostly from Canada,
but includes less-than 1 TCF of LNG.
Our chances of maintaining US domes-
tic natural gas production at about this
level until about 2025 (and maybe far-
ther out) are good, but a much larger
E&P effort than at present will be need-
ed, including areas offshore from our
Atlantic and Pacific coasts.

The chances of oil and natural gas
prices declining in the US, except in the
short-term for natural gas, appear to be
down. Sorry, but this is reality, folks.

The best solution for the US is to sig-
nificantly reduce consumption of crude
oil products and natural gas. I travel to
Germany often on business, where the
standard of living is close to ours. And
about half of the autobahn still does not
have speed limits. Yet, per-capita con-
sumption of crude oil products and nat-
ural gas is about one-half of that in the
US. We can certainly do much better, if
our leaders have the courage to do so.

But, US energy independence is a polit-
cal dream, nothing more.

I know it sounds funny for an oil and
gas producer to advocate less petroleum
consumption. But the potential for lower
future petroleum prices here are dubi-
ous, so my production-based income
should remain about the same, which
will enable me to continue drilling more
wells.

Fortunately, Americans are still
inventive and innovative enough to find
new sources of energy – 50 years from
now the US may be in better shape with
energy supplies than at present. But the
next 20 to 30 years may be difficult, so
far as oil and gas are concerned.

But enough of this dreary petro-econ-
omics. Let us talk about the Institute.

Certified in 1976, I became a typical,
apathetic, disinterested CPG, attending
one or two Section meetings a year, noth-
ing more. Until, in 1991, I volunteered
to join Colorado Section’s Government
Relations Committee. We became heav-
ily involved in opposing legislation that
would seriously affect the CGS. Although
the bill passed, it was made more accept-
able due to successful lobbying by
Colorado CPGs. And for me, the question
“Why AIPG?” was answered. So I became
more heavily involved in the Section’s
political relations work. In 1994, I was
nominated for National Vice President
and won. Since then my involvement has
been at the national level, as President-
Elect, President and Chair of the Task
Force for Continuing Professional
Development. And I have learned how
important active volunteerism is to
AIPG. With our small paid staff, much
volunteer time is necessary to keep AIPG
functioning. But far too few volunteers
are available.

This describes the situation of nearly
all geoscience organizations in the US,
Canada and Europe. If our science and
profession are to thrive, more of you must
meaningfully participate in organizational
activities to make this happen.
Your contributions of time are just as
important as paying your annual dues.

The real payoff for my 13 years of
heavy participation with AIPG has been
the opportunity to work with so many
dedicated CPGs on improving the
Institute and moving it forward into the
21st century. Their cooperation, enthu-
siasm, ideas and innovations have made
my efforts easier over the years. It is with
gratitude and appreciation for their
cooperation that I accept this Award as
symbolic of the Institute’s recognition of
our many successful joint efforts.

Thomas G. Fails, CPG-03174

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AIPG 2004
Annual Meeting Committee

Robert Stewart, General Chairman
Dan St. Germain, Financial Planning
Robert Blauvelt, Technical Programs
Dennis McGrath, Fund Raising
Lance Mead, Field Trips
Craig Werle, Short Courses
Dean Herrick, Registration
Robert Fakundiny, Guest Programs
Jim Richert, Exhibits
Laurie Scheuing, Evening Program
Tom Van Biersel, Academic Liaison
Jan Freedland, Web Master
The Outstanding Achievement Award is given only when an outstanding non-member candidate is proposed by the Honors and Awards Committee and approved by the Executive Committee. I am privileged to offer the fifth recipient, who fully deserves to be in this elite company, Samuel S. Adams, a good friend and a truly amazing contributor to the science and profession of geology. Sam holds A.B. and M.A. degrees from Dartmouth and earned his Ph.D. from Harvard. He spent 24 years as an operating mine, exploration and consulting geologist, with major assignments in the western U.S., Canada, Australia, Mexico, Brazil, Argentina and on advisory projects worldwide. He served as Head and Professor of the Department of Geology and Geological Engineering at the Colorado School of Mines from 1986 to 1991. He demonstrated his versatility by 8 years as President of the Loon Mountain ski resort in Lincoln, New Hampshire until 1998, while continuing a vigorous schedule of work for his favorite geoscience societies.

These contributions to our field, while thoroughly worthy, are not why we honor Sam today. His outstanding achievements lie in his volunteer work for the betterment of the science and profession of geology, exceptionally productive work that makes Sam special. Throughout his career in industry and academia, Sam has been well known for his efforts to bring real-world work experiences to geoscience students.

I have known Sam since 1995, when he was President of the American Geological Institute and I had the good fortune to be on the Executive Committee as a member-at-large. We had an outstanding year that included the initiation of the EarthComm project, strengthening of the Government Affairs Program, and moving AGI into new directions of educational programs on all fronts. His presidential year also marked a time of new and successful expansion of the activities of the AGI Foundation, socrutical to the success of AGI programs.

Sam made an outstanding contribution as Chair of the AGI 50th Anniversary Celebration, which was held at the National Academy of Science in 1998, was highlighted by an all-day symposium featuring the interactions of the geosciences with other sciences (including medicine) and engineering disciplines, and led to the founding of Earth Science Week. Since 2000, Sam has been Editor-in-Chief of Geotimes, and has been the inspiration for the outstanding improvement of that magazine into the premier geoscience news magazine. Sam clearly believes his compass.

I know Sam chiefly through our interfaces at AGI, but his volunteer efforts go far beyond AGI. He has been a leader in the Geological Society of America, as a Counselor and member of numerous financial and policy committees. He is a member and past-president of the Society of Economic Geologists, and had served the American Association of Petroleum Geologists and the Society for Mining, Metallurgy and Exploration. He was appointed to two terms on the Board on Earth Sciences and Resources of the National Academy of Sciences where he was chair and co-chair of two Academy Panels to review the mineral resources programs of the U.S. Geological Survey and hardrock mining on federal lands. He has been an advisor to the National Science Foundation and the U.S. Geological Survey. Sam has been honored by the U.S. Geological Survey with the John Wesley Powell Award in 1998, by AGI with the William B. Heroy, J.r. Award in 2000, and by GSA with its Distinguished Service Award in 2003.

I would be remiss if I did not take notice of Sam and Nancy Adam's contributions to any community they have lived in. They have both been extremely active in the New Hampshire chapter of the National Alliance for the Mentally Ill since 2000. A family tragedy led Sam and Nancy to lend their enormous energies in support of this search for cures for mental illness, and Sam has served since 2002 as its President.

The professional resume and publications list for Sam Adams are truly staggering to read and impossible to summarize. And yet they tell only half the story. The full measure of Sam Adams is the infectious enthusiasm and lightning quick and inventive mind that he brings to everything he does, and he inspires all who work with him to exceed their own expectations. He certainly has for me.

Russell G. Slayback, CPG-2305
Citationist

Every month, readers of Geotimes magazine are instructed by the editor-in-chief right up front to believe their compass. The instructions sometimes vary. For a recent issue about the effect of geology on vineyards, the admonition was to "Believe your compass, but don't mix navigating with wine!"

Such guidance comes from a sage source, a man who has followed his compass well. That compass has led him and Nancy to every part of the world. For some of us, that guidance extends to the sartorial. I took to wearing bow ties after hearing Sam's reasoning behind his choice of neckwear: they make people smile.

When I joined the AGI Government Affairs Program in 1995, Sam gave me a dear measuring stick: that there not be a single major issue facing the geoscience community in Washington to which GAP did not respond. For eight years, I kept the Adams dictum ringing in my ears, and it kept me awfully busy. When I was given the opportunity to edit Geotimes, I agreed to do so only if I could have Sam's compass to guide the effort. As the magazine's editor-in-chief for the past four years, he has generated a wonderful sense of liveliness but also a sense of responsibility to readers from across the geoscience community. Sam has helped create a space in which the sub-specialized academic and the niche-dwelling practitioner can rediscover
their common interests in the broader science that drew them to our profession in the first place.

In a career that spans more decades than I reckon Sam is eager to admit, he and that compass of his have given immeasurable service to the geoscience community, and his leadership roles— including the presidency of the American Geological Institute and the Society of Economic Geologists— have meant so much to so many geoscience societies. When Sam takes on a society role, he does not merely fill a slot but puts in tremendous effort, whether helping to re-anchor the finances of the Geological Society of America when they became unmoored in the mid-1990s or steering the Society of Economic Geologists into the electronic publishing era. Having already served AGI as president, Sam was still willing to step up to the challenge of chairing the institute’s 50th anniversary committee. Sure, he commissioned an excellent booklet reviewing the past five decades of progress, and he threw a great birthday party at the National Academy of Sciences complete with ghosts from the past. But Sam knew that to truly celebrate our profession, a monument to the future was required. Earth Science Week blossomed forth, reaching out to the public and conveying the excitement of understanding our planet. This October will be the eighth annual Earth Science Week, going strong and well on its way to achieving the status of a lasting legacy.

It is fitting for Sam to receive such an honor from the American Institute of Professional Geologists, for Sam is the consummate professional. His work has spanned the gamut of our profession, holding senior leadership positions in the minerals industry as well as chairing the geology department at the Colorado School of Mines. Given that breadth of experience, it is no wonder that Sam has been called upon so often, to serve not only our societies but also our government. Through his volunteer service with the National Research Council, Sam has been a trusted advisor to government, both as chair and member of numerous committees. Back in 1995, he chaired a committee on the future of the minerals program at the U.S. Geological Survey during a period of tumultuous reorganization and layoffs. In that difficult time, he did not just deliver a report and walk away. He explained the report’s recommendations at an all-hands meeting of the program’s staff, in the process giving them a sense both of purpose and possibility.

Finally, let me note that as much as Sam has done for the geoscience community, his gifts of time, insight and effort have been granted to others as well, and tellingly so. For Sam’s compass points not to magnetic north but to a truer north defined by ethical rectitude and genuine care for his fellow travelers. He shares that moral compass with Nancy, reflected in their devotion to helping other families deal with mental illness through the National Alliance for the Mentally Ill.

And so it is with great pleasure and personal admiration that I join Russ Slayback in congratulating Sam on receiving this prestigious award. I would like to thank AIPG for making such a wise choice and for the opportunity to share these thoughts.

David Applegate, MEM-002
Citationist

Response

Mr. President, distinguished honorees, members and guests. You will perhaps appreciate just how indebted I am to my generous citationist. As honest a gentleman as Russ Slayback is, he is also a creative artist, and for his colors and flourishes on my behalf, I am most grateful. Thank you, Russ.

In a sense, awards such as this are really for each and every one of us. Without selfless and spirited volunteer service the lifeblood of any non-profit will soon vapor away. Each volunteer needs to be nurtured, but at the same time imagine the mayhem of two hundred awards here this evening. Instead, please share in my good fortune, for if it really serves its purpose it will warm and hearten you as well, for all you do.

And one final thought. The earth sciences have seriously outgrown the charge of their early years, namely, to explore, discover, describe, understand, extract, subdue and use the earth. Earth science has become so much more than science and use of the earth. For some time now the earth sciences have been morphing, sometimes seamlessly and sometimes awkwardly and reluctantly, into a new calling that might be described as “Sustaining Human Life and Earth Systems”.

As we embrace and broadcast this very significant change in assignment, it will most likely multiply our assignments and invitations, as well as our contributions and will enlighten public perceptions about the role of earth science in our lives on Earth. That will be good, and AIPG will have a major role.

My sincere thanks to the Institute for this honor.

Samuel S. Adams
Summary of 2004 Executive Committee Meeting

John T. Howard, CPG-08740

On Sunday, October 3, 2004, the 2004 AIPG Executive Committee met in Saratoga Springs, New York, in conjunction with the 2004 Annual Meeting. Executive Committee members, visitors, honored guests of the annual meeting, and Institute members were present during the proceedings.

The agenda included several action items:

- Formal ratification of changes to the AIPG Ethics Code. This action formalized the interim vote that the Executive Committee took via fax in September.
- Formally approved the 2005 operating budget for AIPG.
- Referred several items of concern to the Institute's Legal Counsel for an opinion on the legal issues involved in their implementation. This included adopting a policy that AIPG would not contribute Institute funds to political candidates.

Reports were given by each of the officers:

- Vice President Dale Nations summarized his effort at surveying sections and gathering information regarding the communications and working relationships between headquarters and the section level.
- Editor Ray Talkington announced that the January/February issue of TPG will be an all student issue and encouraged members to solicit contributions from students. He also reported on the final printing and distribution of the new “History of AIPG” book that is now available.
- Past-President Richard Powers reported on the on-going efforts to develop corporate memberships within AIPG, as well as, his appointment to chair the new Finance Committee of the Institute.
- President-Elect Robert Font discussed his plan and goals for the upcoming year. This included expansion of the CPD program, development of online education courses, to be offered by AIPG for continuing education credits, and expansion of the value or worth of the CPG credentials.
- President Bob Corbett provided a review of the Institute accomplishments during the past year and announced his selections for the Presidential Award of Merit certificates.
- Marc Boivin, president of the Canadian Council of Professional Geologists (CCPG) was invited to make a presentation on the efforts of his organization and AIPG to begin working on a memorandum of understanding for cooperation between the two organizations. CCPG represents professional geologists licensed by 8 of the 10 Canadian provinces. Since each province has their own licensing requirements, CCPG works to develop reciprocity and comity for professionals working throughout Canada.
- Garath L. Jones from the Irish Geological Institute gave us an update on the status of his organization, as well as, bringing greetings and best wishes from Christer Ackerman, the president of the European Federation of Geologists (EFG). One item of note in Garath’s report was that preliminary discussion have been initiated between AIPG, CCPG, and EFG regarding the hosting of the 3rd International Congress of Professional Geologists. CCPG and AIPG have broached the idea that the conference be held in North America in 2008. Stay tuned for more exciting news regarding this event.

A report was presented on the results of last year’s D.C. Fly-in and discussion. Peter Lyttle of the USGS gave a presentation of USGS’ goals and programs in the coming year and the status of those programs in the federal budget process. Dr. Jim Williams was introduced as the chairman and organizer of the 2005 Fly-In and a discussion was held on how to maximize our efforts on specific issues rather than taking a “shotgun” approach to meeting with policymakers at next year’s Fly-In.

President-Elect Font and Dr. Detlev Doherr gave a presentation on the distance learning initiative that they have been developing to enable AIPG to offer online continuing education classes. In the coming months, you will hear more about this and its implementation.

The meeting was adjourned until the 2005 Executive Committee meets in Tucson, Arizona in February 2005.

The Executive Committee would like to commend the Northeast Section on a wonderful meeting at a truly magnificent venue. The planning and hard work paid off and the meeting was a huge success and enjoyed by all.
Daniel St. Germain CPG-07858

The Northeast Section hosted the 2004 AIPG Annual Meeting in Saratoga Springs, New York. The meeting, held in a 100 year old hotel/conference facility that had 19th Century charm, was located in a state park that is world famous for its geysers and European style mineral springs. The venue was beautiful and even though we missed the Northeast’s famous peak leaf season by a week or so, mother nature did not disappoint us by providing world class scenic beauty. Those who were brave enough to venture into the Adirondack and Green Mountains on field trips were rewarded with glimpses of mountain sides and river valleys that challenge even an oil painter’s palette with a color spectrum from evergreens to yellow and orange elms to fiery red sugar maples. Even those of us who have lived in the Northeast all of our lives, look forward to the unchallenged beauty of the fall foliage season in the Northeast.

The Annual meeting kicked off with a bang at the Ice Breaker. Over 100 people attended the event; eating a meal worth of luscious hors d’oeuvres, talking with exhibitors, networking with old colleagues, and making new friends. The room was packed for three hours and everyone had great time. The banquet was equally a hit with honored guests and awardees, a humorous citation by Susan Landon about the life and times of Tom Fails, and a meal that replaced the standard rubber chicken with beef tenderloin/crab stuffed shrimp and delectable chocolate truffle cake that would rival any five star restaurant. The meeting’s social activities ended with a dinner cruise on Lake George that was worth of luscious hors d’oeuvres, talking with exhibitors, networking with old colleagues, and making new friends. The room was packed for three hours and everyone had great time. The banquet was equally a hit with honored guests and awardees, a humorous citation by Susan Landon about the life and times of Tom Fails, and a meal that replaced the standard rubber chicken with beef tenderloin/crab stuffed shrimp and delectable chocolate truffle cake that would rival any five star restaurant. The meeting’s social activities ended with a dinner cruise on Lake George that was a lot of fun, too!

One of the staples of these annual meetings is great field trips and there were many. As Doctor Seuss said…..“Oh, the Places You’ll Go” and we did! Lance Mead took a group into Vermont to see the wonderful examples of Vermont marble. Bill Prehoda took a group to see world famous NY/VT slate, Steve Stokowski took groups to see Howe Caverns and the Caves and Quarries in the Albany area. Bill Kelly (Figure 1), acting New York State Geologist, took a huge group up to Gore Mountain to examine the geology and mining history of Barton Garnets, which are used in coating abrasives, glass grinding, metal and glass polishing, and even to remove red hulls from peanuts. Paint manufacturers add garnets to create non-skid surfaces and television makers use it to prepare the glass on the interior of color picture tubes prior to the application of phosphorous. Barton sells between 10,000 to 20,000 tons annually. Barton Garnet gets its high quality grade from its characteristic “partings” (resembling cleavage) producing chisel-like edges yielding superior cutting qualities.

Dick Young (Figure 2) took an energetic group 500 feet beneath Gotham City to explore New York City’s New Water Tunnel. The group heard a two hour discussion of the entire New York City water supply system including source reservoirs, aqueducts, leaking aqueducts, stilling reservoirs, tunnels, and the groundwater system. It was a spirited discussion of one of the most intriguing water supply systems in the world lead by our host Dick Young (Figure 3 and Figure 4). The tour was fascinating and participants learned about the geology of Manhattan, saw examples of anomalous pegmatite granite, and learned various aspects of how to map a cylindrical tunnel. New York City was a gracious host by providing on-site personnel that guided us through the tunnels describing the tunnel boring machine, the role of the Sand Hogs, and various aspects of bedrock tunneling and washing down the tunnel so we could see through the flour and mud that generally collects on the walls of the tunnel. Thanks NYC and Dick for a “once in a life time” opportunity.

When we started down this journey three years ago we talked extensively about our demographics and about locating the meeting central to our members to make it easy and economical for them to attend; about how to get members of the involved with the organization of the meeting so they will come to make sure their event goes off without a hitch; about offering events that will draw members to the meeting and not just offer events to keep them busy; about how most of the field trips were organized for the 80 to 100 members that come to every meeting but we had to offer something different, something more to convince new members to attend; about how to convince organizations to be sponsors; about how 60 percent of the National membership and 95 percent of the Northeast Section membership work in the environmental business and we had to offer something that could also appeal to them something that could be used to further their professional development; but...
mostly we talked about our Section membership about how the key to a successful meeting was going to be our Section membership attendance. If you asked me when we started, "what would be the key issue to a successful meeting", I would have said Section attendance, but in hindsight I would have a different answer. The reality is that all of these issues were extremely important. It was important to get all of them right, because failure of any one of these issues would have dramatically affected the success of the meeting.

We also talked about what we called the "measure of success". What matrix would we use to determine if we had a successful meeting. Would it be profit at the expense of quality? Would it be value for the dollar or would it be what we called the "fun factor"? We tried very hard to manage all three of these "measures of success" and a fourth-your perception. We offered a quality meeting at a fair price. We hosted the meeting in a beautiful venue giving each full registrant a quality bag, lots of high quality hors d'oeuvres, and beef tenderloin & crab stuffed shrimp with chocolate truffle cake. And we all had fun. Unfortunately, human nature is not blind to visual perceptions, so we tried to manage those, too. I will not go into details on the different ways we tried to managed your perceptions, but let us just say they worked!

My advice to the next group organizing the Annual Meeting would be to surround yourselves with as many quality dedicated people as possible. Empower them to manage tasks, field trips, or events with oversight to retain ultimate accountability. Be prepared to find more and more people who will help organize the meeting as the committees need more and more help. This can not be overstated! Keep costs down. With your firms permission, use their facilities as much as possible for photocopying and postage. These costs can add up quickly and be prepared to make difficult maybe unpopular decision. It is your job! But most of all have fun.
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