TPG

Volume 50, Number 6

THE PROFESSIONAL GEOLOGIST

NOVDEC 2013

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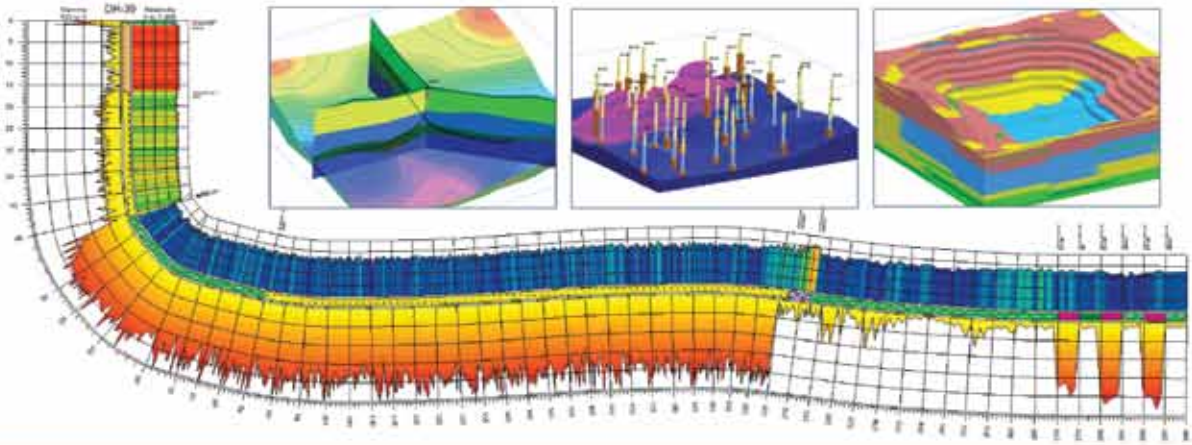

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The unit on the skyline is the Mississippian Pahasapa (Madison) Limestone, the reddish brown sandstone across the middle of the photo is the upper unit of the Cambrian-Ordovician Deadwood Formation known as the Skolithos sandstone. The small slope break between the upper Deadwood and the Pahasapa is the Mississippian-Devonian Englewood Formation. The gray unit in the lower right hand portion of the photo (by the creek) is the basal Deadwood Formation which is a conglomeratic sandstone.

Photo: Taken by W. Siok, CPG-04773 along Boxelder Creek in Nemo, SD. Description: Foster Sawyer, PhD, CPG-10000.

DEPARTMENTS

AIPG Publication Policy, October 4, 2010. AIPG encourages submission of articles and editorials for publication in *TPG* on topics related to the science and profession of geology. Submittals shall be of interest to the members of AIPG, other professional geologists, and others interested in the earth sciences. Articles and editorials may be noted as follows at the discretion of the Editor, "The opinions, positions and conclusions presented herein are those of the author and do not necessarily reflect the opinions, positions or conclusions of the American Institute of Professional Geologists." All materials submitted for publication, including author opinions contained therein, shall include accurate and appropriate references. The Editor has the authority to solicit, edit, accept, or reject articles and editorials and other written material for publication. The Executive Committee has the authority if it so chooses to act on any particular case to support or overrule actions of the Editor regarding the solicitation, editing, acceptance, or rejection of any particular article, editorial, or other written material for publication.

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 ombudsman 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 an effective advocate for the profession of geology and to serve its members through activities and programs that support continuing professional development and promote high standards of ethical conduct.

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For AIPG news and activities go to www.aipg.org.

AIPG's Members' Private Medical Insurance Exchange For Members and Their Employees

Available through AIPG's GeoCare Benefits Insurance Program

www.geocarebenefits.com

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A medical insurance exchange is simply a marketplace where you choose from the health insurance products available to you in your state, much like choosing between Granny Smith and Golden Delicious apples. You can choose from a variety of insurance companies, plan designs, options, and premium rates which meet your needs and suit your budget. For more details, please talk with the fully-licensed medical insurance agents at our Private Exchange.

While the plan benefits may be similar, the real difference comes after enrollment. We will not turn you loose. We will continue to be there for you to answer questions and help with any disputes. As stated by two members of the Committee on Group Insurance, the service you'll receive from the Private Exchange is the gravy on your potatoes and the icing on your cupcake.

Open enrollment is now open for guaranteed-issue health insurance plans with an effective date of January 1, 2014 without exclusions for pre-existing conditions.

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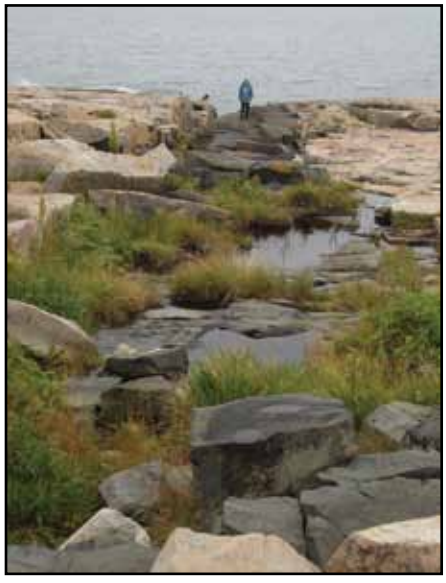

A diabase dike intruded into the Schoodic Granite at the outer edge of Acadia National Park on its extreme NE extent. Photo by Larry Austin, CPG-05181.

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS

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.
12000 Washington St., Suite 285
Thornton, CO 80241

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
MAY

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.

Guadalupe Mountains National Park Receives International Geological Designations

National Park Service News Release-(Pine Springs, TX) Guadalupe Mountains National Park Superintendent Dennis A. Vasquez announced that the park has been recognized by the Subcommission on Permian Stratigraphy of the International Union of Geological Sciences with the placement of plaques marking the park's three Global Stratotype Sections and Points (GSSPs). Dr. Shuzhong Shen, current Chair of the Subcommission, Dr. Charles M. Henderson, past Chair of the Subcommission, and Guadalupe Mountains National Park geologist Dr. Jonena Hearst placed the bronze markers in the park this past Spring.

According to A Geologic Time Scale 2004 (Gradstein, Felix M., James G. Ogg and Alan G. Smith, [Editors], Cambridge University Press, Cambridge, U.K., 2004), "…the basal boundary of each stage is standardized at a point in a single reference section within an interval exhibiting continuous sedimentation. This precise reference point for each boundary is known as a Global Stratotype Section and Point (GSSP), and represents the point in time when that part of the rock succession begain." Hearst stated, "GSSPs, which are established by consensus within the international geological community, have proven to be extremely valuable in understanding the timing of events in earth history because everyone is using the same language. The sedimentary beds bearing the plaques identify the base of each of the geologic stages within the Guadalupian Series which appear in the park. "

Researchers realized the need for standard FIXED-TIME definitions for geologic units and horizons so that the name of the unit would mean the same thing to everyone, no matter where they are. The Global Stratotype Sections and Points are 'golden spikes' for the international geological community. These sections and points allow geologists to correlate rocks and fossils from one locality to another across continents and oceans, giving geologists a common reference and vocabulary for discussing local, regional, and global events in geology and paleontology."

These sections and points allow geologists to correlate rocks and fossils from one locality to another across continents and oceans, giving geologists a common reference and vocabulary for discussing local, regional, and global events in geology and paleontology."

The Permian Periodis the last period of the Paleozoic Era The Permian, is subdivided into three series, the Cisuralian, , the Guadalupian, and the Lopingian, The Permian witnessed a progression from an greatest icehouse climate to a hothouse climate culminating in the biggest mass extinction -of all time. At the end of the Permian, about 95% of the Earth's marine species and 75% of its terrestrial species went extinct. During the Permian, the world was dominated by a united supercontinent, called Pangaea, and surrounded by a global ocean called the Panthalassa Sea. Many Permian marine deposits are rich in fossils of all types of invertebrates animals. Many of the animals, such as fossil brachiopods, fusulinids, conodonts and ammonoids are useful in correlating rocks from different regions. They are also useful reconstructing the palaeogeography and palaeobiogeography of that time.

GSSP of the Capitanian Stage of Nipple Hill.

GUMO Superintedent Dennis Vasquez, GUMO Geologist Dr. Jonena Hearst, Dr. Charles Henderson, Dr. Shuzhong Shen after installing Capitanian GSSP marker.

AIPG 2013 Honors and Awards Program

The American Institute of Professional Geologists (AIPG) has a history of effective and outstanding service to the profession of geology. From its beginning in 1963, the Institute has emphasized the role that professional geologists play in this fascinating, changing, and highly complex world in which we live.

In an Institute such as this, there are so many highly motivated geologists contributing to the profession, the Institute, the public, and the nations in which we live and work that the identification of a select few for particular awards is a monumental task. The continued success of the Honors and Awards Program is dependent on an accessible nominating process and a diligent screening of those nominated. This is done by the Honors and Awards Committee.

Currently, there are six honors bestowed by the Institute: Ben H. Parker Memorial Medal, Martin Van Couvering Memorial Award, John T. Galey, Sr. Memorial Public Service Award, Award of Honorary Membership, Outstanding Achievement Award, and Presidential Certificate of Merit.

AIPG MISSION STATEMENT

The Mission of the American Institute of Professional Geologists (AIPG) is to be an effective advocate for the profession of geology and to serve its members through activities and programs that support continuing professional development and promote high standard of ethical conduct.

Please find the 2014 Honors and Awards nomination form on page 43 of this issue. The deadline for the 2014 nominations are due to the AIPG Headquarters by January 20, 2014.

Jonathan G. Price, CPG 7814
2013 Recipient of the AIPG
Ben H. Parker Memorial Award

Jon is a consulting geologist and the Nevada State Geologist Emeritus. Jon was the State Geologist and Director of the Nevada Bureau of Mines and Geology, a research and public service unit of the University of Nevada, Reno, from September 1, 1988, until his retirement from the University on June 30, 2012. He earned a bachelor's degree in geology and German from Lehigh University and master's and Ph.D. degrees in geology from the University of California, Berkeley.

His geological career has included experience with industry (Anaconda and U.S. Steel), teaching (Bucknell University, The University of Texas at Austin, and University of Nevada, Reno), research, and government (Texas and Nevada). He has worked in copper, iron, and uranium exploration and mining; taught undergraduate and graduate geology courses and supervised graduate theses; and conducted and directed research at state geological surveys. During 1993 and 1994, he was on loan from the University of Nevada to the National Research Council as the staff director of the Board on Earth Sciences and Resources. He was the 1998-2002 President and Chair of the Board of Directors of the Western States Seismic Policy Council, the 2000-2001 President of the Association of American State Geologists, the 2003 President of the Society of Economic Geologists, and the 2006-2007 President of the Nevada Petroleum Society. He served as the Secretary of the Nevada Earthquake Safety Council from 1995 until 2011 and Chair of the Nevada Hazard Mitigation Planning Committee from 2003 until 2012. He is currently the Treasurer of the Geological Society of America, a Member of the Board of Directors of the Society for Mining, Metallurgy, and Exploration, and the Vice President/President-Elect of the Geological Society of Nevada.

Jon was the 1997 President of AIPG, the Nevada Section President in 1993, Co-convener of the AIPG-GSA-AAPG-USGS-NSF-sponsored Conference on Ethics in the Geosciences in 1997, Technical Sessions Chair for the 1992 AIPG annual meeting, and Vice Chair of the joint AIPG-AEG annual meeting in 2002. He received the John T. Galey, Sr. Memorial Public Service Award in 1999.

Jon has recently been evaluating global trends in mineral-resource production with an emphasis on opportunities for exploration. His current research also includes the evaluation of copper, zinc, gold, and other ores for by-product production of critical elements, particularly those needed for emerging technologies. In addition, he continues to investigate magmatic-hydrothermal systems associated with highly evolved rhyolites, other igneous rocks, and related ores with high concentrations of beryllium, lithium, fluorine, thorium, and rare earths. He and Beth spend their spare time volunteering as master-level race walk judges and national-level umpires for USA Track and Field.

Response

There is no finer honor than to be recognized by one's peers, and because geology is by far the best profession, there isn't anything nicer than being honored by AIPG. It's also quite a thrill to be selected for the medal that has been received by so many of my geo-heroes and mentors. It is truly humbling to be among the ranks of those who gave so much to the profession of geology. I'll single out a few with whom I have had some close interaction:

- Bill Fisher – who showed many of us how to build a strong state geological survey, who demonstrated how to add some humor into meetings of volunteers of professional organizations; and who recruited me to spend

two years at the National Research Council, where I more or less learned how the federal government tries to work;

- Charlie Mankin – who devoted years to creating the successful National Cooperative Geologic Mapping Program that has produced thousands of new geologic maps by the state geological surveys and the U.S. Geological Survey, and that has helped feed the pipeline of geologic mappers for industry, government, and academia;
- Larry Woodfork – who highlighted the intersection of geology and public policy through the Association of American State Geologists' Pick and Gavel Award to political leaders recognized for their contributions to our science;
- Susan Landon – who helped start the now global Earth Science Week celebrations that bring the excitement of geology to the general public;
- Marcus Milling – who rejuvenated AGI as the umbrella organization for the geos (geologists, geophysicists, geochemists, and various other geoscientists) in the US.

I would also like to note a few other Parker Medalists with whom interactions fortified my belief that geologists have the most fun and are, with AIPG's encouragement, professionals in the truest sense: John Haun, Bob Weimer, Ernie Lehmann, Pete Flawn, Russ Slayback, Tom Fails, Bob Jordan, Dennis Pennington, Bob Fakundiny, John Rold, Robert Font, and Rick Powers.

One of my most enjoyable AIPG activities has been the Nevada Section's career days, in which we have exposed geology undergraduate and graduate students to the rewarding job opportunities that await them. What has come across so clearly in these sessions has been the geologists' love for the profession. I truly love geology, of course not as much as I love my wife, Beth, or our children, Alexander and Argenta, both of whom learned enough geology during family discussions and field trips that they didn't even take a geology class in college.

I thoroughly enjoyed the public service part of my career in state geological surveys, in large part because I felt that both the Texas Bureau of Economic Geology and the Nevada Bureau of Mines and Geology made significant contributions to economic development and to the health and safety of the public. A few of my publications may have contributed in these areas, but mostly I'm proud of the work done by those with whom I worked. When one takes on the responsibility of the team leader, one generally gives up the glory of the successful author while devoting energy to helping others achieve success. I'm particularly pleased to have had some great support staff who helped raise the Bureaus' productivity of geologic maps and applied reports. I'm also happy to be back in the private sector, mostly consulting for the mineral industry, at a time when society is needing more mineral and energy resources than ever before. Beth and I are continuing our service to the profession and industry, and we look forward to doing so for many years to come.

Thank you very much for the Ben H. Parker Memorial Medal!

Jonathan G. Price

Robert A. Stewart, CPG 8332
2013 Recipient of the AIPG
Martin Van Couvering Memorial Award

Bob's interest in geology began during childhood family picnics to Lake Ontario. The beach was stabilized with limestone rip-rap that made for excellent fossil-picking. A few years later, the baseball field at his grade school provided a further instructional experience – the infield diamond was dressed with crushed, pyritic greenstone from northern Ontario. If the game was slow, prospecting for pyrite cubes was an easy diversion. Bob's teacher was married to a geologist, who was working in the Abitibi Greenstone Belt during the staking rush that accompanied the discovery of the Kidd Creek volcanogenic massive sulfide deposit. His high school biology class included several chapters on ancient life which kept the spark glowing.

Bob enrolled at Lehigh University as a biology major, and included introductory geology during his first semester. A class field trip to the Delaware Water Gap sealed the deal. Bob changed his major to geology and never looked back. At Lehigh he completed a BS and MS in Geological Sciences, and a Ph.D. at the University of Western Ontario, with research on glacial geology, soils and ore prospecting. Summer work during graduate school gave Bob an opportunity to apply glacial geology to ore prospecting for several mining companies with claims in northern Ontario and Nunavut. After completing doctoral work, Bob taught glacial geology, geomorphology, aerial photograph interpretation and groundwater geology at Iowa State University from 1982 to 1988, and supervised undergraduate and graduate students who conducted original research mapping glacial deposits and analyzing till mineralogy.

After academia, he changed careers to environmental consulting, moving to Connecticut in the process. He has been employed in senior technical and managerial roles by several local consulting companies, and has been a senior geologist with ARCADIS since 2008. His professional focus is surficial geology in respect to site investigation and remediation of disturbed land. In addition to the CPG credential, Bob is also a Licensed Environmental Professional (LEP-CT), a Licensed Site Professional (LSP-MA), Registered Geologist (PG-NC), Registered Sanitarian (CT), and Registered Environmental Health Specialist (NEHA). He also belongs to SME and PDAC. Bob created two courses for LEP/LSP/PG continuing education – soil science as a tool for environmental consultants, and the surficial geology of Cape Cod.

Bob also found time to complete a year-long distance learning program in hydrogeology through Wright State University (1985), and an MS in soil science at the University of Massachusetts (2007). Bob's other professional interests include research on gold mine tailings dams, heavy metals in soil, and rare earth element (REE) deposits in weathering crusts.

Bob served the Northeast Section on its executive committee, as newsletter editor, president, and co-chair of the 2004 AIPG annual meeting in Saratoga Springs, New York. At the national level he served as associate editor, editor, and on the national screening committee. He received a Presidential Certificate of Merit in 2011 for his work as editor of *TPG*. Bob has made presentations to

geology students at various colleges, universities, and professional organizations including AIPG, GSA and the Young Earth Scientist Network, discussing professional licensure and certification, the hiring process, geoscience careers, and the profession of geology.

Outside of work Bob enjoys traveling with his wife, Kimberly, competitive swimming with his daughter, and surfing with his son.

Response

I joined AIPG in 1991 as Certified Professional Geologist No. 8332. The CPG was the only membership category available at the time. Hadyn Murray was President of AIPG, and his congratulatory letter to me was typed. I still have it tucked away as a remembrance. Hadyn included the adage in his letter that "You only get out what you put in," and I've taken that advice to heart ever since. My local home with AIPG has always been the Northeast Section. The first local AIPG meeting I attended included a tour of the Peabody Museum in New Haven. The first two CPGs I met at the meeting were Russ Slayback and Dennis McGrath, by virtue of the line through the buffet. Many of you know Russ for his long and distinguished service to AIPG. Dennis has been a mainstay of the Northeast Section, serving on its executive committee, as President, as a key organizer of the 2004 annual meeting, and presently as the chair of our committee that administers the Angelo Tagliacozzo Scholarship.

At subsequent sectional events I met two local CPGs who, as with Russ Slayback, eventually received the Martin van Couvering award – Bob Fakundiny and Dan St. Germain. The basis for this award is service to AIPG. For me this has included using my geologic knowledge in my community as well – as a counselor for a variety of merit badges with the local Boy Scout troop, answering questions about dredging and wetlands for the town's land trust, and to help my church resolve matters of underground storage tanks, hazardous materials, and an environmental site assessment during a capital improvement project.

My service with the Northeast Section began as a member of the executive committee. After Russ Slayback retired as the section's newsletter editor, I followed as the editor from 2000 to 2005. My stint as editor also gave me the means to advertise the 2004 annual meeting in Saratoga Springs, New York, which I co-chaired. As the editor, I was responsible for finding the content to fill the empty space around advertisements and regular items of news and information. I often wrote about my experiences interviewing geoscience students and working with young professionals, two groups of geologists that are now the fastest-growing part of AIPG. Extending our reach and services to students and early-career geologists is critical to the future of AIPG and our profession.

AIPG's expanded membership gave me a chance to share my experience over three careers with geoscience students, and to show how AIPG can help them advance their own careers. In 2005, the GSA Northeast Sectional meeting, coincidentally also in Saratoga Springs, included a short technical session on geoscience careers. There were four talks in the session, and I gave two – one dealing with the hiring process and the second on my work in mineral exploration. I was astonished to speak to an audience of over 200, with many questions afterward. This small technical session was a huge draw to the student audience. The four presentations were the first exposure to the profession of geology beyond academia for the majority of the students, and many faculty members. I quickly realized that my favorite stories in the presentations would always have a fresh audience each year, as new students moved into geoscience degree programs. Since then, I've made it a personal goal to give a presentation to a student audience at least once a year.

In 1998, I joined the National Screening Committee, on which I still serve. In reviewing scores of CPG applications, I'm constantly amazed at how our members find their way into geology in college and university, and then into the many geoscience career paths. A common thread in the employment verifications and sponsor statements is the role of significant academic and professional mentors. We are a positive influence when we share our time with others, especially students and young professionals!

In 2009, I was asked to give a video presentation on professional licensure and credentials at the First Young Earth-Scientists Congress in Beijing, through the efforts of the American Geoscience Institute. I made at least a dozen takes to record a 15-minute presentation, and through that process I came to fully appreciate why good actors make so much money. Not long after, I received an e-mail from a former academic colleague, Nazrul Khandaker, who now teaches at the City College of New York. He found my presentation on the Internet, and remarked that it had impressed him and his students. I thanked him for his generosity, and we had a chance to catch up after many years. My point from these examples is that my experiences, and yours, are worth a great deal to our future members and their mentors in academia. Giving back to the profession is an integral part of AIPG, and spending time with students is one of the best ways to do it.

As editor since 2009, our student issue began each year in the January-February *TPG*, and now student contributions typically run into the March-April issue as well. This is a testament to our efforts to attract student members. *TPG* is unique in offering students a means to publish early-career research and opinions; this opportunity isn't found in traditional mainstream technical journals. I enjoy the editorial process of shepherding articles from initial submittal through final publication. The hard work of our authors and associate editors is a credit to *TPG*, and I've made new friends along the way.

In closing, I want to thank AIPG for this singular honor. I am also forever grateful to my family, who over the course of my career has supported my interests beyond my professional life.

Robert A. Stewart

Scott W. Tinker, CPG 10564
2013 Recipient of the AIPG
John T. Galey, Sr.
Memorial Public Service Award

Dr. Scott W. Tinker is the Director of the Bureau of Economic Geology at the University of Texas at Austin, State Geologist of Texas and director of the Advanced Energy Consortium. He is a professor holding the Allday endowed chair and the Acting Associate Dean for Research in the Jackson School

of Geosciences at the University of Texas. He is past elected President of the American Association of Petroleum Geologists (AAPG), past president of the Association of American State Geologists, and past president of the Gulf Coast Association of Geological Societies. He is an Advisory Trustee to Southwest Research Institute, sits on the Geoscience Advisory Board at Sandia National Lab and the Trinity University Board of Visitors, and holds appointments on the National Petroleum Council, the Interstate Oil and Gas Compact Commission, and several other private, professional, and academic boards. He is a trustee on the AAPG, AGI and AASG Foundations. Dr. Tinker has testified several times before the U.S. Congress. Tinker's passion is building bridges between academia, industry and government, and towards that end he has given nearly 600 invited and keynote lectures, visited nearly 50 countries, all US states, and flown over 3 million miles speaking to industry, government, universities, NGOs, adult education, civic associations, trade groups, primary school, and many, many others. He maintains a research program in global energy and is currently leading a research team conducting a major study of U.S. shale gas reserves and production that is gaining national attention for its innovative approach and rigor.

Most recently, he co-produced and is featured in the award-winning documentary film on global energy, *Switch*. *Switch*, created in partnership with the film's co-producer and director Harry Lynch, provides Tinker with the vehicle to explore the world's leading energy sites, from coal to solar, oil to biofuels, many highly restricted and never before seen on film. *Switch* was filmed in 11 countries and contains interviews with over 50 energy experts and visits to over 20 energy sites. Tinker gets straight answers from international leaders of government, industry and academia. In the end, he cuts through the confusion to communicate a future that is remarkably pragmatic. *Switch* is the first truly balanced energy film, embraced and supported by people all along the energy spectrum – fossil and renewable, academic and environmental. *Switch* is part of the *Switch* Energy Project, a multi-pronged effort designed to build a balanced national understanding of energy. To date, the film has been screened over 700 times in theaters, and countless classroom and private showings, and is estimated to have reached over 2,000,000 people across the globe. Scott has personally attended 70 of those screenings, where he leads spirited discussions about energy. *Switch* has been shown 300 times on college campuses. The Project's website and social media outlets have tens of thousands of followers. A new partnership to provide *Switch*-related education videos to teachers participating in the National Energy Education Development Project (NEED) should assure that *Switch* and its vital energy message will reach over 65,000 K – 12 classrooms across America for years to come.

Scott's impact on the general public's perception of geosciences, energy and policy and his extensive volunteer, educational, research and leadership activities have been broad and deep

Response

To receive the AIPG John T. Galey, Sr., Memorial Public Service Award is at once a huge honor, and given the list of prior recipients, extremely humbling.

None of this happens without the support of many, many outstanding people. We are, ultimately, products of our experiences. My parents, Tom and Jan, never told me to do anything. They just expected my best. That seemed to work. I have been lucky to have been mentored by several great people along the way: Ed Roy, Bob Sneider, James Lee Wilson, Charlie Kerans, Bill Fisher, Peter Flawn, and Jay Kipper, to name just a few. My outlook contacts contain 6741 names as of this writing; I guess in this day and age we call those "friends!" Some have been fleeting and others lifelong, but all have influenced me in ways too numerous to describe. Harry Lynch, my partner in *Switch*, is creative, intelligent, practical, and diligent; that makes him rare if not unique as a filmmaker. He deserves credit for much of what is embodied by *Switch*, which has now reached over 2 million viewers worldwide.

Travelling to 50 countries and all 50 US states, giving over 600 talks, and flying over 3 million miles across several decades has been exhilarating, exhausting, and at times a bit lonely. I wouldn't trade those experiences for anything. My tolerance for human difference and appreciation of the natural wonders of this wet planet have expanded immeasurably.

I am eternally thankful that I met Allyson when she was at an impressionable age, and thus thought I would amount to something. We have been married 30 years. Without her and our four wonderful kids telling me that the house runs better when I am gone, I would not be able to do what I do. Ironically, I don't engage in public service out of a sense of altruism; quite the opposite. My motivation is purely selfish. I believe that objective education is one of the few things that will make the world a better place for….me…and my 6741 friends around the world! And even more, public service feeds my workaholic tendencies and personal passions.

Whatever my motives, it nonetheless means more than I can say to be recognized by my peers for these efforts. I am truly appreciative and grateful. Thank you.

Scott W. Tinker

William J. Siok, CPG 4773
2013 Recipient of the AIPG
Honorary Membership

Bill discovered the geologic profession after initially trying his hand at aeronautical engineering. He ascribes his enthusiasm and deep appreciation for geology to his tutelage under the high caliber professors at his alma maters, Rensselaer Polytechnic Institute in Troy, New York and South Dakota School of Mines & Technology in Rapid City, South Dakota.

He spent the major portion of his career, before becoming AIPG Executive Director, as teacher, state government regulator, and consultant. As soon as he earned the requisite experience in 1980, he applied for AIPG Certification. It was through his membership in the AIPG Northeast Section that Bill became active on the national level.

Bill admits he isn't qualified to join Mensa, but he has applied his abilities to the enjoyment of the science and profession of geology and to the achievement of the AIPG mission. A particular enthusiasm of his is to encour-

age and support the efforts of the AIPG Executive Committee and especially section officers and members to bring students and young professionals into AIPG governance.

Bill says his association with AIPG as member, CPG, national executive committee member, and executive director has been the highlight of his professional career. A most satisfying aspect of his association with AIPG has been the opportunity to work with so many talented colleagues, particularly the 15 presidents with whom he worked during his tenure, and of course the superb AIPG headquarters staff.

This award is accepted with gratitude. The fact of the matter is that after nearly fifteen years as Executive Director, Bill is beholden to hundreds of AIPG members, professional colleagues, and friends for the opportunity to serve the profession in this capacity. Special thanks to Ron Wallace, a stalwart and enthusiastic President, who has made Bill's last full year so satisfying and productive.

AIPG is unique as a professional society. It was founded in 1963 by petroleum geologists who recognized the need for a post-academic credential attesting to the individual's competence, integrity, and ethics. Receiving the Honorary Membership Award on the occasion of the 50th anniversary of AIPG's founding is particularly auspicious for Bill because this anniversary year marks the last full year as AIPG Executive Director, and the beginning of his 33rd year as an AIPG CPG.

Bill is particularly proud of his role in furthering the AIPG professional relationships with sister societies with which cooperative programs have been established. These societies include the American Geosciences Institute, Association of American State Geologists, Geosciences Canada, the European Federation of Geologists, the Institute of Geologists of Ireland, the Geological Society of America, and the American Association of Petroleum Geologists.

Response

"Nothing is more honorable than a grateful heart." So said Roman stoic and philosopher Seneca in the 1st century. You friends, colleagues, my wife Gail, who are present this evening, and many other colleagues who are no longer with us or otherwise unable to be here, deserve and are given my gratitude for your friendship, guidance, and support during my years as Executive Director.

My association with AIPG as member, CPG, national executive committee member, and executive director has unquestionably been the highlight of my professional career. My years with AIPG have accorded me the opportunity to develop friendships throughout the US, Canada, and many European countries. The honor has been mine through these relationships, many of which have become fast.

Many, many colleagues are among those whom I trusted, have confided in, and from whom I have sought advice on numerous occasions. Many times the advice and support given have been invaluable and have made all the difference in an action which needed to be taken.

I am especially honored to be on the same agenda as my three colleagues who are also award recipients. They are each accomplished professionals. I consider them friends and am proud to be their colleague and to have been included with them in this ceremony.

I extend a special thank you to Ron Wallace, a stalwart and enthusiastic President, who has made my last full year eminently satisfying and productive.

Thank you all!

William J. Siok

AIPG Honor and Awards Committee

James A. Jacobs, Chairman
John L. Bognar
Richard M. Powers
Daniel J. St. Germain

Presidential Certificate of Merit

Each year, the AIPG President may award one or more certificates of merit to individuals who, through dedicated and meritorious service, have made an outstanding contribution to the Institute.

Recipients of the AIPG Presidential Certificate of Merit

Presented by
Ronald J. Wallace, CPG
2013 President

Christine F. Lilek, CPG 10195

I met Christine last year at our annual meeting and told her we hadn't heard much from the Wisconsin Section. Since then a few section articles have been printed in the *TPG*. The Wisconsin Section sponsored the 2013 Earth & Water Student Conference and is discussing a Frac Sand conference for next year. For her work with the Wisconsin Section I would like to present this certificate to her.

Stephanie K. Jarvis, SA 1495

Stephanie has been writing our Student's Voice column in the *TPG* since Jan/Feb 2010. I finally had the opportunity to meet Stephanie at our annual conference in Chicago. I've enjoyed reading her articles and it is important to hear from our student members. We need to continue to reach out to our student members and to hear from them. For all the great articles she has written I present this certificate to her.

Vickie L. Hill

Vickie has been a joy to work with throughout the year and really makes my job easier. She responds to all my crazy requests and she keeps me to the deadlines. Vickie is very dedicated to the membership and enjoys working with the Executive Committee and helping individual members. She is a wealth of knowledge dealing with the membership. For her dedication I would like to present this certificate to her.

A Paleoenvironmental Analysis of the Middle Devonian Gravel Point Formation, Western Michigan

Joseph Mohan, SA-2094
Mohan1je@cmich.edu

Abstract

A paleoenvironmental analysis of the Gravel Point Formation, a stromatoporoid patch reef deposit exposed in western Michigan, provides insights into conditions existing in the Michigan Basin during the Middle Devonian Period (Givetian). Samples were collected from shore cliffs and bedding planes at six locations along the Lake Michigan coastline of Little Traverse Bay. The six sample locations yielded an invertebrate fauna consisting of 19 species, distributed among brachiopods, corals, bryozoans, arthropods, cephalopods, stromatoporoids, ostracodes, and polychaetes, as well as a possible arthropod fragment. The palynologic component consists primarily of amorphous organic matter, followed by algal colonies, scolecodonts, miospores, and acritarchs. This is the first report of ostracodes and polychaetes within the Gravel Point Formation. The fossil assemblage, along with sedimentologic evidence, indicates the Gravel Point Formation was deposited in a low energy, shallow, normal marine environment, with intermittent storm episodes.

Introduction

The Middle Devonian Traverse Group of Michigan comprises numerous limestone and intermittent shale beds resulting from multiple transgressions and regressions that swept across a distal muddy sea-floor in a carbonate marine environment (Gardener, 1974).Within the Traverse Group, the Middle Devonian (Givetian) Gravel Point Formation was deposited in a shallow carbonate shelf dominated by stromatoporoid patch reefs (Meyer, 1989).

According to Kesling *et al.*, (1974), the Gravel Point Formation invertebrate fauna contains 87 species and subspecies. Although ostracodes have been reported from the Traverse Group (Warthin, 1934), specimens have not been specifically described from the Gravel Point Formation. Three unnamed species are reported herein. Furthermore, the first report of polychaete worm jaw structures (scolecodonts) from both the microfossil and palynologic residue are also reported. Palynologic analysis revealed a number of algal colonies, scolecodonts, miospores, and acritarchs.

Stratigraphic and paleontological examination indicates deposition of the Gravel Point sediments in a shallow lagoonal reef environment. Middle Devonian bioherms, such that occur in the Gravel Point Formation, are characterized by small size when compared to Silurian and Lower Devonian barrier reefs. As such, each bioherm contains much greater biological diversity than those from older age reef formations of the Michigan Basin (Stumm, 1969).Thus, to fully understand Devonian reefs and biodiversity within the Michigan Basin, an individual paleontological study of each bioherm and surrounding lagoon must be conducted.

Location

The Gravel Point Formation is defined by a series of outcrops, quarry exposures, and road cuts along the shore of Little Traverse Bay, Michigan. Samples were collected from six locations along the lakeshore of Little Traverse Bay near Petoskey, Michigan (Figure 1). Location GP-1 (Kesling *et al.*,1974; location 35-5-32NE) remains exposed along the lake shore, a few paces west of Boulder Lane within Petoskey's city limits (Figure 1). The outcrop ranges from one and a half meters to three meters thick and is composed of non-fossiliferous fine-grained limestone. Location GP-2, Bay Front Park (Kesling *et al.*, 1974; location 35-5-32SW), is composed of a massive stromatoporoid reef, nine meters thick (Figure 1). Small beds of broken shells are present; however, the specimens are destroyed beyond identification. Locations GP-3 and GP-6 are

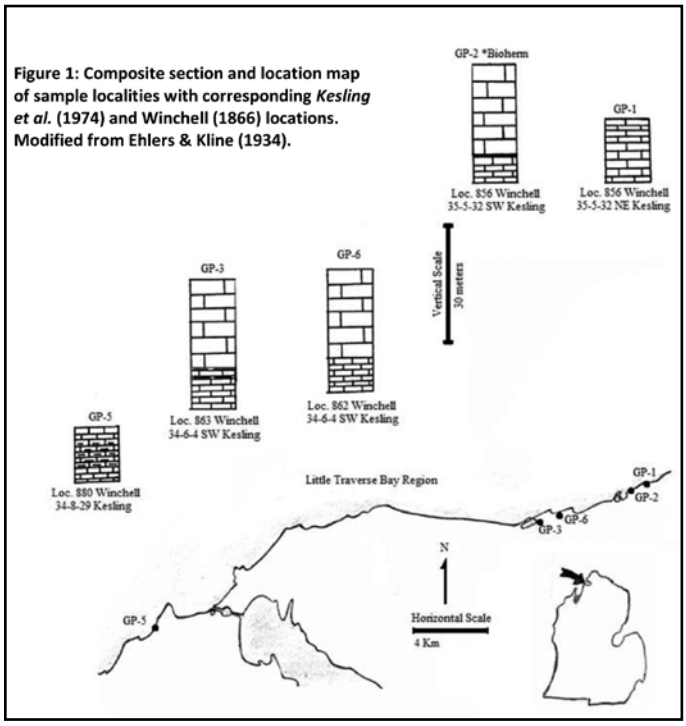

Figure 1: Composite section and location map of sample localities with corresponding *Kesling et al.* (1974) and Winchell (1866) locations. Modified from Ehlers & Kline (1934).

located on a former quarry wall in what is now known as East Park and were originally reported by Kesling et al. (1974) as location 34-6-4SW. The entrance to East Park is located 1.3 kilometers east of the entrance to The Village at Bay Harbor (Figure 1). These outcrops consist of dark brown to grey shaley limestone. Locality GP-5 (Figure 1) consists of bedding planes along the shore, as well as 0.6 – 0.9m shelves more inland under the tree line. Locality GP-5 is found by heading north along the beach from the parking spaces located at the end of Bells Bay Road and is just north of the north entrance to Fisherman's Island State Park (Figure 1). Bedding planes of fine-grained limestone and shale exist at a few exposures near the water's edge; a small outcrop of fine-grained limestone, approximately two thirds of a meter thick, is located inland where the beach meets the woods.

Stratigraphy and correlation

The Gravel Point Formation, part of the Traverse Group of Michigan, correlates with the Long Lake Limestone and Alpena Limestone of eastern Michigan and is considered Givetian in age (Ehlers & Kesling, 1970; Dorr & Eschman, 1970; Kesling *et al*., 1974; Catacosinos *et al*., 2001) (Figure 2). The Gravel Point Formation is composed of shaley bituminous bands within a thinly laminated sequence of shaley limestones and sporadic stromatoporoid bioherms. The type locality was not specifically designated by Pohl (1929), but Kesling *et al*., (1974) subsequently designated Pine River Point, which is also known as South Point and Gravel Point, three kilometers west of the mouth of Pine River as the type locality. Here a limestone reef extends around the point (Winchell, 1866).

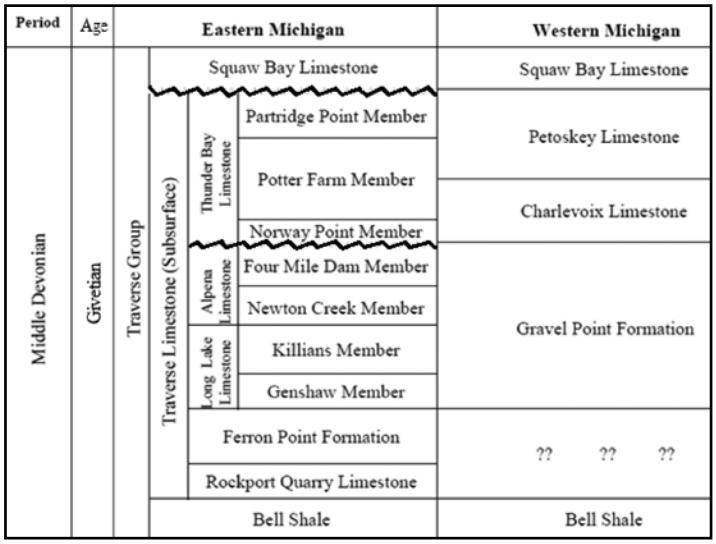

Figure 2. Middle Devonian stratigraphic nomenclature of Michigan. Compiled from Ehlers & Kesling (1970); Dorr & Eschman(1970); Kesling *et al*.(1974); Catacosinos et al. (2001).

Methods

Sampling locations follow Kesling *et al*., (1974). The collection was made from road cuts, shore cliffs, and bedding planes at five locations (Figure 1). Identifications of the megafaunal specimens were made from plates of Kesling *et al*., (1974) and others. Identifications were reconfirmed by comparison to the original Gravel Point Formation collections housed in the University of Michigan Museum of Paleontology. Microfaunal ostracod specimens were removed from sample surfaces. Samples from locations GP-5, GP-3, and GP-6 (Figure 1) were dissolved in dilute hydrochloric acid to remove the limestone matrix. Bryozoans and polychaeta scolecodonts were recovered by sifting the remaining material. A sample from location GP-5 (Figure 1) was further dissolved in hydrofluoric acid for palynological analysis rendering up miospores, acritarchs, algal colonies, and scolecodonts. During palynologic processing, the samples produced a strongly petroliferous odor and yielded an oily residue.

Faunal list

Only selected specimens that are well preserved are illustrated.

Phylum Porifera
Class Stromatoporata
Order Stromatoporoidea
Family Stromatoporidae
Parallelopora winchelli (Plate II, figs. 1, 2)
Phylum Cnidaria
Class Anthozoa
Order Tabulata
Family Favositidea
Favosites mammilatus (Plate II, fig. 3)
Phylum Bryozoa
Class Gymnolaemata
Order Cryptostomata
Family Fenestellidae
Fenestellapolypore magnifica (Plate III, fig. 1)
Phylum Brachiopoda
Class Articulata
Order Strophomenida
Family Stropheodontidae
Strophodonta costata (Plate I, figs. 1-5)
Strophodonta cf. S.*erotica*
Order Spiriferida
Family Atrypadae
Atrypa corrugata
Family Spiriferacea
Mucrospirifer latus (Plate I, fig. 6)
Mucrospirifer sp.(Plate I, fig. 7)
Class Rhynchonellata
Order Atrypida
Family Atrypidae
Pseudoatrypa Keslingi (Plate I, figs. 8, 9)
Phylum Mollusca
Class Cephalopoda (Plate III, fig. 3)
ClassTentaculita
Order Tentaculitida
Family Tentaculitidae
Tentaculites sp. (Plate III, fig. 4)
Phylum Annelida
Class Polychaeta
Several species and the first report from the Gravel Point Formation. (Plate V, figs. 1-3, microfaunal residue; figs. 4-6,

palynologic residue)
Phylum Arthropoda
Unidentified 'hook'
Subphylum Crustacea
Class Ostracoda

Several species and the first report from the Gravel Point Formation. (Plate IV, figs. 1-7).

Phylum Echinodermata
Crinoidcolumnals
Palynoflora
Miospores
Ancyrospora sp.
Acritarchs
Lophosphaeridium sp. (Plate VI, fig. 3)
Tasmanites sp. (Plate VI, fig. 2)
Algal colonies (Plate VI, fig. 1)

Paleogeography

During the Middle Devonian, the Michigan Basin was a shallow marine shelf located within the central region of Laurasia. The continent was located between 30º South and 20º North latitude (Wicander & Monroe, 2013). The depositional source area for eroding sandstones and shales was primarily the eroding highlands of the Appalachian mobile belt, which formed the eastern boundary of the marine basins at that time (Wicander & Monroe, 2013).

Paleoenvironmental Interpretation

An assortment of carbonate and shale strata defines the Gravel Point Formation. The fossiliferous limestones are indicative of fairly shallow water, whereas the soft, thinly-stratified shales indicate deeper water (Kesling *et al*., 1974). The thinly bedded shale-limestones of location GP-5 (Figure 1) are indicative of shallow water deposition. Polychaetes (plate III), recorded at location GP-5, are an indication of close proximity to the shoreline because the jaw structures are associated with other near shore organisms (Stauffer, 1939). Bioherms, at Location GP-2 (Figure 1) and reported by others, are fairly common and their growth depends upon a narrow temperature and depth window within low energy shelf-ramp settings in Devonian platforms (Kershaw, 1998). Beds of broken brachiopod shells surrounding the stromatoporoid reef at Location GP-2 (Figure 1) indicate intermittent storm deposits.

Kesling *et al*., (1974) interpreted the lack of major reef build-up up during deposition of the Gravel Point Formation sediments as a result of fluctuating sea level that is reflected in numerous lithological changes. An area of lagoonal lithology has been described by Jodry (1957), and in this reconstruction, the lagoonal waters of the west basin are cut off from the normal marine waters to the east in the Michigan Basin by a barrier reef during the lower Traverse Group time. This barrier reef was replaced by patch reefs during deposition of the Gravel Point Formation sediments, indicating the shoreline had migrated east during the late Givetian.

Summary and conclusions

Samples were collected from the south shore of Little Traverse Bay in western Michigan. More than 80 species of invertebrates had been identified by Kesling *et al*., (1974) within the Gravel Point Formation. Reexamination of the formation has revealed only 19 species from this collection, four of which have not been previously reported within the Gravel Point Formation.

Gravel Point fossils first reported here include polychaeta worm jaw structures, in the form of scolecodonts (plate V), and three ostracode species (plate IV). The patch reefs of the formation are composed of the stromatoporoid *Parallelopora winchelli* (plate II, figs. 1, 2). Auxiliary tabulate corals, *Favosites mammilatus,* existed in small colonies within lagoonal areas (plate II, fig. 3).

The Gravel Point Formation has been interpreted as a Middle Devonian lagoonal and patch reef-dominated unit that was deposited in a shallow sea within the northern lower-latitudes. The patch reefs communities contained a diverse flora and fauna.

Acknowledgements

I thank the following individuals for their help and advice on this research project and resulting paper: Dr. Reed Wicander, Dr. Andrea Bair, Mr. Josh Barringer, Mr. Martin Steinbis, Dr. Jim Student, all of the Department of Earth and Atmospheric Sciences, Central Michigan University, and Dr. Dan Miller, University of Michigan Museum of Paleontology.

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Plates

Plate 1: Selected specimens only. Source of identifications is in parentheses.

Phylum Brachiopoda

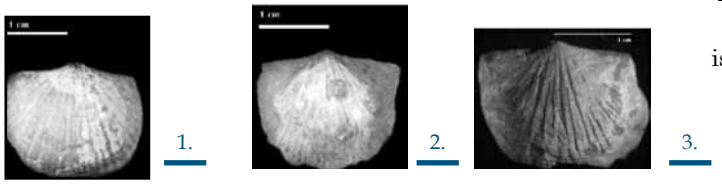
Figs. 1-5. *Strophodonta costata* (Kesling et al., 1974. Pl. 4, p. 137)

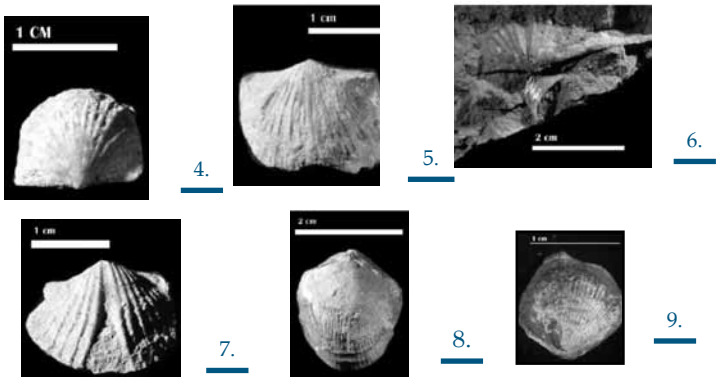
Fig. 6. *Mucrospirifer latus* (Stumm, 1956. Pl. 3, Figs. 21-27)

Fig. 7. *Mucrospirifer* sp. (Kesling et al., 1974. Pl. 11, p. 153)

Figs. 8, 9. *Pseudoatrypa Keslingi* (Jensen & Wicander, 2011)

Plate II: Selected specimens only. Source of identifications is in parentheses.





Phylum Cnidaria

Figs. 1, 2. *Parallelopora winchelli* (Kesling et al., 1974. Pl. 22, p. 173)

Fig. 3. *Favosites mammilatus* (Stumm& Tyler, 1964. Pl. 1, Fig. 2)

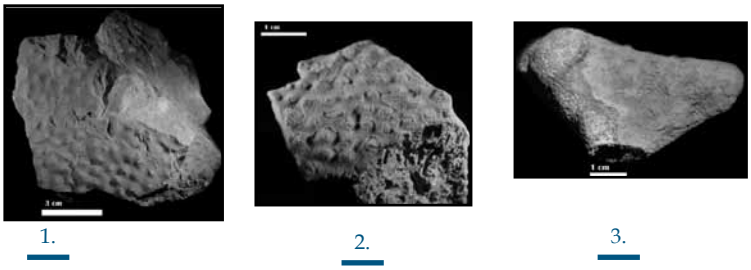


Plate III: Selected specimens only. Source of identifications is in parentheses

Phylum Bryozoa

Fig. 1. *Fenestellapolypore magnifica* (Deiss, 1932)

Fig. 2. Bryozoan

Phylum Mollusca

Fig. 3. Nautiloid

Fig. 4. Tentaculites sp.

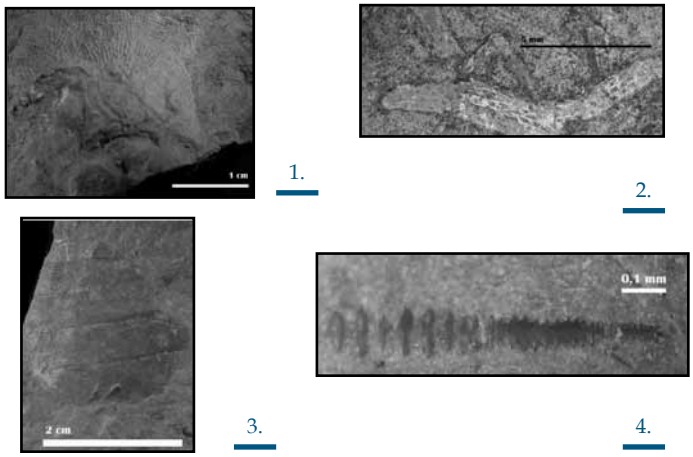


Plate IV: Selected specimens only. Source of identifications is in parentheses.

Phylum Arthropoda

Figs. 1-7. First report of ostracodes from the Gravel Point Formation.

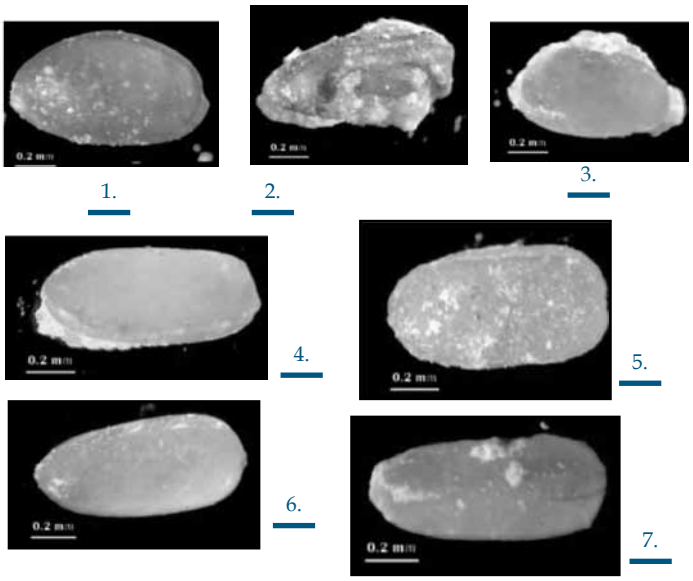


Plate V: Selected specimens only. Source of identifications is in parentheses.

Phylum Annelida

Figs. 1-3. First report of Polychaeta from the Gravel Point Formation.

Figs. 4-6. First report of palynomorph scolecodonts from the Gravel Point Formation.

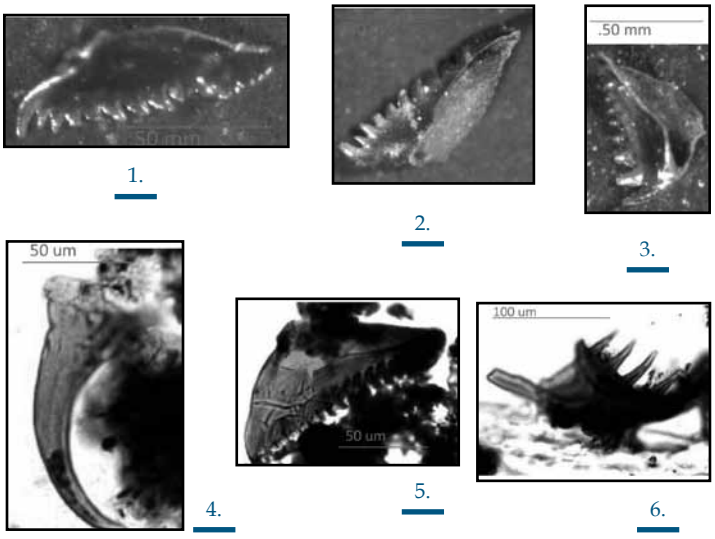


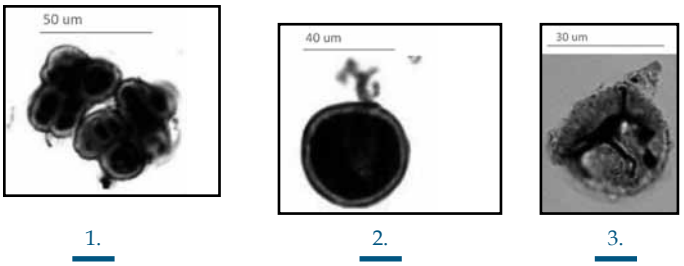
Plate VI: Selected specimens only.

Palynoflora

Fig. 1. Algal colonies.

Fig. 2. *Tasmanites* sp. (Acritarch)

Fig. 3. *Lophoshaeridium* sp. (Acritarch)



Reviewed by AIPG Associate Editors Edward Baltzer, CPG-08861, John Berry, CPG-04032, Solomon Isiorho, CPG-07788.

Joseph Mohan is a Geology student at Central Michigan University and will be graduating in May 2014. I have worked on research projects with gold bearing quartz veins from Timmins, Ontario. I have also used my skills as a technical rock climber to assist in a research project mapping shear zones on the side of a 60 foot cliff known as the Maiden Creek Sill in the Henry Mountains in southern Utah. I have found my passion in paleontology research and will continue to pursue a career as a paleontologist.

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2. **Use passwords effectively**. Don't share them or keep them in plain view. Avoid common words, and names and birthdays of family and friends. Use a combination of letters and numbers in both upper and lower case. Change your password every 90 days and consider using a different password for each of your online accounts.
3. **Secure your browser and email applications.** Check the Tools or Options menus for built-in security and privacy features. Regularly update security software patches. Filter spam out of your email inbox. Never open an attachment in an email from an unknown sender.
4. **Install protective software**. Turn on automatic update to download the most recent virus "anti-dotes." Put up a firewall that blocks hackers from tampering with your information.
5. **Beware of "phishing."** Never respond to an email requiring that you update or validate account information under threat of dire consequences. No legitimate company would make this request. Instead, forward the email to *spam@uce.gov* and report it to the company being impersonated.

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REFUNDS & CANCELLATIONS: All cancellations must be received in writing and sent to Ron Wallace by mail or e-mail. Phone cancellations are not accepted. All cancellations postmarked-dated by April 16, 2014, will receive a REFUND minus a 25% administrative fee.

Wisconsin Earth and Water Student Conference – Connecting Students to Professionals

The first annual Wisconsin Earth and Water Student Conference, held on September 20th, 2013, at the University of Wisconsin-Whitewater campus, gave the students a supportive and safe venue for first-time research presentation practice and networking opportunities to connect with professionals in their chosen field of study. Dr. George Stone from Milwaukee Area Technical College was the keynote speaker at the conference, with a presentation entitled "Global Climate Change: Overriding Challenge of the 21st Century."

Approximately 60 people attended the conference, including presenters and supporters from UW–Madison, UW-Milwaukee, Carthage College, UW-Parkside, UW-Green Bay, UW-Fox Valley, UW-Stevens Point, Milwaukee Area Technical College, and UW-Whitewater. Seven professional organizations also attended and spoke with the students about job hunting and career development: WI AIPG, Wisconsin Department of Natural Resources – Office of Business Support, Science & Sustainability, River Edge Nature Center, UW–Madison Office of Sustainability, American Society of Civil Engineers, Career and Leadership Development Office, and Sierra Club–John Muir Chapter.

Students offered posters and oral presentations on a variety of earth and water science topics. The following presentations garnered monetary prizes, which were presented by Ronald Wallace, National President of AIPG & Christine Lilek, President of Wisconsin Chapter AIPG:

Best Oral Presentation

Na-Hyun Jung (UW-Milwaukee)

"Fault-Controlled CO_2 Leakage from Natural Reservoirs in Colorado Plateau"

Best Undergraduate Poster Presentation

Lisa A Griffin (UW-Whitewater)

"Effects of Wastewater Treatment Plant Effluent on Survival, Growth and Vitellogenin Concentrations of Fathead Minnows"

Best Graduate Poster Presentation

Alexis K Helm (UW-Green Bay)

"Characterization of Sediment and Phosphorus Losses from an Event Driven, Agricultural Watershed"

This meeting, which was jointly sponsored by the Wisconsin Chapter of the American Institute of Professional Geologists (AIPG, *http://www.aipgwisconsin.org/*), Wisconsin Groundwater Association (WGWA, *http://www.wgwa.org/*) and UW-Whitewater *(http://www.uww.edu/)*, will become an annual event.

Christine F Lilek – CPG 10195
Wisconsin AIPG

Student Poster discussion.
Photo by Tapan Shah.

AIPG booth exhibit at the conference. Photo by Tapan Shah

AIPG National President Ron Wallace visiting with Jack Travis CPG-07378, retired professor from UW Whitewater.
Photo by Prajukti Bhattacharyya.

Soft Rock to Hard Rock Field Trips

For two weekends this Fall the Georgia Section has had two separate field trips. The first field trip was for our student members where we drove to Andersonville, GA and visited CE Minerals kaolin facility. Our AIPG member Robin Dozier organized the visit. We had almost 30 student members and five faculty professors attend from Columbus State University, University of West Georgia, and Georgia Southwestern State University. We started with a safety lecture by Butch Hammack, CE Minerals, before we visited the kaolin open pits. Next Dr. Tom Weiland led a discussion on the history of the mining activities followed by the regional stratigraphic section of the area and compared it to Providence Canyon further to the west where the Cretaceous section is exposed. The stratigraphic section that we saw ranged in age from Paleocene to Eocene and the depositional environment was shallow near shore, low energy, marine or estuarine transitioning to marine and nonmarine and deltaic. We then drove out to the kaolin pits and had an opportunity to see the stratigraphic intervals and discuss the deposition and learn about the mining activities.

One of the kaolin open pits.

Andersonville National Cemetery.

After the field trip we went back to the office where we had lunch provided by CE Minerals and our cook Robin Dozier. During lunch Butch Hammack spoke about geology careers in the mining industry and some of the training and responsibilities taken on by the geologists. Afterwards Ron Wallace gave AIPG baseball caps to Robin, Butch, and Tom for all their help in making this field trip such a success.

After lunch everyone had an opportunity to visit Andersonville National Historic Site, which included the Civil War prison site, Andersonville National Cemetery, and National Prisoner of War Museum.

Graves Mountain, Georgia.

Our second field trip was to Graves Mountain, which is near the Georgia – South Carolina border. Graves Mountain is a metavolcanic monadnock that was mined for refractory kyanite from 1963 until the mid 1980's. The mountain is world renowned for mineral collecting mainly rutile, lazulite, and pyrophyllite. We visited on one of the two weekends per year that the caretaker opens the mountain to the general public. We invited both the Tennessee and Carolina sections to come and search for minerals. The mountain covers a very large area and members were scattered throughout the day in different areas. We were able to talk to some of the local mineral collectors that spoke about some of the rutile crystals discovered. Late in the day is was rather hot and I gave the cooler of water and soft drinks to a few of our members and to our student members from Columbus State University. After the field trip I learned that AIPG members from South Carolina and Tennessee and students from Georgia State University were there.

Columbus State students with student chapter sponsor Ron Wallace. Ricky Biancardi, Eric Tate, Ron Wallace, Buffy Cook, Jeremy Miller, and Mark Bair.

Jim Ashworth, Dean McCarty, Allen Ashworth (West Georgia student) and Rob Deal.

New Student Chapter at Georgia Southwestern State University

The newest student chapter was presented before the Executive Committee and AIPG 50th anniversary. The new chapter is the 5th for Georgia Section. On October 18th the Georgia Section had a drilling demonstration for the students at GSWS. A permanent monitoring well was installed on campus by Atlas Geo-Sampling Company. Direct push was used in order for the students to describe continuous soil samples to groundwater. After the monitoring well was installed the well was developed and groundwater sampling was demonstrated. We would like to thank Jim Fineis with Atlas Geo-Sampling and Sam Almaee with Geological & Environmental Consultants, Inc.

From left to right: Joseph Kinard (President), Donavan Dickey (Treasurer), Tyler Tomberlin (Vice President), and Koster Guyton (Secretary).

Students and professors examining the soil samples.

Georgia Southern University Cone Penetration Test Demonstration

AIPG member Rick Ricci made arrangements for the geology students to see a cone penetration test (CPT). Terracon contracted with the university to conduct geotechnical testing for a new storage building on Georgia Southern campus. Rick also discussed environmental investigations and showed the students bailers, photo ionization detector, and screened casing used in monitoring wells. We hope to install a monitoring well on campus in the future and discuss soil description, soil and groundwater sampling.

Ron Wallace, CPG-8153
AIPG Georgia Section President

Georgia Southern geology students and professors.

Should I Become a CPG?

Have a you been thinking about upgrading your membership to CPG? If the answer is yes, What are your waiting for? To find out if you have the qualifications go to Article 2.3.1 of the AIPG Bylaws. The AIPG Bylaws can be found on the AIPG website or the directory.

The CPG application can be found on the website under 'Membership'. Just follow the instructions. The basic paperwork includes the application, application fee, transcripts, geological experience verification and sponsors.

If you have any questions, you may contact Vickie Hill, Manager of Membership Services at aipg@aipg.org or call headquarters at 303-412-6205. ***www.aipg.org***

Louisiana Board of Professional Geoscientists

NOTICE TO THE APPLICANTS FOR GRANDFATHERING ONLY DEADLINE: JANUARY 1, 2014

In accordance with the Louisiana Professional Geoscience Practice Act, amended by Act 308 of 2012, an applicant who applies for licensure prior to January 1, 2014, shall be exempt from taking the examination described in a. R.S. 37:711.15(4)(a), if the applicant satisfies all the other requirements of Subsection 711.15.

In an effort to maximize efficiency, the Board is creating a web based Application form for data entry directly into our database. Because of the possibility of delays to the completion of this form, the Board is accepting a preliminary Grandfathering Application Form to ensure grandfathering status for applicants. Under the above provision, any geoscientists who want to gain the grandfathered status must use the Grandfathering Application Form. This form is downloadable from the lbopg.org website.

The first step of the application procedure is to complete and mail a Grandfathering Application Form and a check in the amount of $200, to the Board at the address: LBOPG, P.O. Box 14209, Baton Rouge, Louisiana 70898. In addition, a digital copy of the completed form should be emailed to *apply@lbopg.org*.

The submittal of this grandfathering application and the fee is only a part of the application procedure. In order to complete the application process, the applicant must fill out the regular application forms electronically through this website. The web based application forms will be made available when the work is complete.

Upon the receipt of both the grandfathering application and the regular application forms, along with all other required documents, the Board will review the completed applications and make decisions regarding the issuance of the applicant's P.G. License.

Is Your Profile Correct?

It is important to keep your address, phone numbers, and e-mail information up to date in our records. Please take the time to go to the AIPG National Website, ***www.aipg.org,*** login to the member portion of the site and make sure your information is correct. You can edit your record online. If you do not know your login and password you can e-mail National Headquarters at *aipg@aipg.org* or call (303) 412-6205.

The Future of Colleges and Universities – Quo Vadis?

Robert A. Stewart, CPG-08332

One of the professional hats I wear is that of Registered Sanitarian (RS – Connecticut) and as a Registered Environmental Health Specialist (REHS) through the National Environmental Health Association (NEHA), coincidentally headquartered in Denver. I obtained the RS-CT credential in 1997 in advance of some work on a failed septic system when I was involved as an expert witness. See my column in the July/August 2013 *TPG* for a few reminiscences. Membership in NEHA includes a subscription to the Journal of Environmental Health (JEH).

This year, JEH has included a regular column by Thomas Frey, Senior Futurist and Executive Director of the DaVinci Institute© of Louisville, CO. Frey's recent columns were entitled ***By 2030 Over 50% of Colleges Will Collapse: Parts 1 and 2.***[1] Frey's central point in Part 1 of his columns is that until recently, colleges have not embraced change at the same pace as other parts of society. Frey offers the music industry as an example – vinyl LP albums met with competition from cassette and eight-track tapes, compact disks, and most recently digital recordings.

Colleges now provide extensive on-line offerings; however, the essential product – a degree of one kind or other – is the same as it was 200 years ago. Moreover, most degrees still require enrollment at a brick-and-mortar institution, with all the attendant overhead costs. Since the beginning of the 21st century, tuition and fees at most colleges and universities have increased at a rate far exceeding that of inflation.[2] Compounding this problem is the increasing failure of the traditional paradigm that a college degree reliably leads to a well-paying job. Aggregate student loans topped $1 trillion for the first time in 2013, with the federal government by far the leading creditor.[3] For recent graduates, the lack of consistent employment has led to a dire outlook for loan repayment and financial stability.

Frey notes that 2000 marked the beginning of a drop in the demand for cognitive tasks typically associated with traditional, intensive collegiate education.

In Part 2, Frey offers eight primary reasons why over 50% of colleges will fail by 2030:

1. Overhead costs are too high – for instance, uneconomic athletic programs, underlying financing of infrastructure, etc.
2. Substandard classes and teachers – hundreds of schools teach the same classes. Those schools that can differentiate themselves with A-list teachers, with electronic offerings, will have a leg up on the competition.
3. The Internet has made instructor and class quality transparent. Bad ratings will affect the entire school. For examples see *www.ratemyprofessors.com*.
4. Inconvenience of time and place – brick-and-mortar settings can focus attention, but are not necessarily responsive to students requiring a flexible schedule.
5. Pricing competition – the basic choice at present is between free courses without credits and expensive classes with credits. The consumer base is becoming increasingly price-sensitive.
6. Credentialing system competition – colleges have a competitive advantage in their ability to grant credits, which continues as long as the consumers have faith in the system. Colleges now face competing systems through companies such as Coursera, Udemy and iTunesU.
7. Relationships formed in colleges will be replaced with other relationship-building systems – college friendships can be valuable, but as often may be over-rated. Business and social relationships of the future are as likely to begin online.
8. Sudden realization that "the emperor has no clothes!" – for centuries the college system of education has relied on a premise of trust to instill in students valuable knowledge to create a better workforce and society. This concept has become far less defensible in today's economy, in which the value of many college degrees has collapsed.

In the early 1980s, corporate campuses were a popular model of commercial development. Many of the same campuses have been demolished or abandoned as routine tasks that required close physical proximity, e.g. data processing, are now outsourced or increasingly automated through the Internet, requiring fewer employees and less infrastructure. Frey suggests a parallel scenario in which non-traditional education will divert the student pool away from traditional colleges, increasing competition, and resulting in declining enrollments that become unsustainable in terms of the long-term viability of some schools.

Frey gives compelling enrollment statistics since the inception of popular online course providers – one billion course downloads (iTunesU); 3.2 million registered students in one year (Coursera); and, 8,000+ courses for 800,000+ students (Udemy). Geology began as a field science, and still is, with the expanding benefits of numerical methods, chemical analyses, and cross-discipline research. How will geological education evolve with this shift in instructional methods, especially in respect to field training?

1. JEH, v. 76(3), pp. 58-59, and v. 76(4), pp. 44-45. Many of Frey's musings on the same subject can be found in his blogs at *www.FuturistSpeaker.com*.
2. For comparative costs and increases from 1999 to 2010 on a nationwide basis, see *http://chronicle.com/article/Interactive-Tool-Tuition-Over/125043/*, accessed December 11, 2013.
3. Ripping Off Young America: The College-Loan Scandal, by Matt Taibbi. Rolling Stone, August 15, 2013. And, the federal government profits from the student loan program.

Answers on Page 24

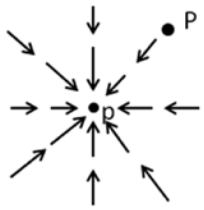
Robert G. Font, CPG-03953

1) "Bauxite" is most typically related to:
   a) Carbonatites
   b) Stalactites
   c) Laterites

2) The chemical and mineralogical analysis of a given igneous rock yields the presence of abundant SiO_2, $KALSi_3O_8$ and $KAl_2(Si_3Al)O_{10}(OH)_2$. We conclude that the rock crystallized from:
   a) Felsic magma
   b) Mafic magma
   c) Ultramafic magma

3) Full-diameter cores taken from a series of vertical wells drilled in a region specific region find specimens of **Turritella** and **Inoceramus** in upper layers and specimens of **Geisonoceras** and **Timanites** in deeper strata. Based on this, we suspect an overturned section:
   a) True
   b) False
   c) You must be joking!

4) The force of gravity and the concept of the gravitational field are important in a variety of geoscience applications. Please consider a particle "A" of mass "m" at a fixed point "p" in space. Also consider a particle "B" of mass "M" which is free to take up various positions (P). Please refer to the figure below.



From Newton's Law, we know that:

$F = GmM/r^2$, where G is the gravitational constant.

If we let $GmM = k$, then:

$F = k/r^2$

The force "F" can be represented in terms of the magnitude of a vector "$\mathbf{þ}$". Let $|\ \mathbf{þ}\ |$ indicate the magnitude of vector $\mathbf{þ}$. Thus, $F = |\ \mathbf{þ}\ |$ where $F = |\ \mathbf{þ}|$ is directed from "P" to "p". Then:

$|\ \mathbf{þ}\ | = k/r^2$

If "p" and "P" have coordinates (x,y,z) and (X,Y,Z), respectively, then the distance "r" between "p" and "P" is:

$r = [(X\text{-}x)^2 + (Y - y)^2 + (Z - z)^2]^{1/2}$

Given these, which of the vector functions shown below best describes the gravitational field acting on particle "B"?

   a) $\mathbf{þ} = -k/r^2\ (X - x)\ \boldsymbol{i} - k/r^2\ (Y - y)\boldsymbol{j} - k/r^2\ (Z\text{-}z)\boldsymbol{k}$
   b) $\mathbf{þ} = -k/r^3\ (X - x)\ \boldsymbol{i} - k/r^3\ (Y - y)\boldsymbol{j} - k/r^3\ (Z\text{-}z)\boldsymbol{k}$
   c) $\mathbf{þ} = -k/r^4\ (X - x)\ \boldsymbol{i} - k/r^4\ (Y - y)\boldsymbol{j} - k/r^4\ (Z\text{-}z)\boldsymbol{k}$
   d) What??!!

The Last Word

Ronald J. Wallace, CPG-08153
ronald.wallace@dnr.state.ga.us

First I would like to thank the National Headquarters staff for all their support and help this year. No matter if I'm dealing with a national issue or my own section issues, they are always there to support me. For this I give them a resounding Thank You. Also I'd like to thank Bill Siok, our Executive Director, who kept me from wandering too far off course as we brainstormed ideas to make AIPG a world class organization.

I have been so honored this year being your national president. I've been able to travel to a number of section meetings, and at every one of these meetings I've been able to incorporate suggestions and ideas into national plans and goals. Earlier this year I received an email from James Williams of the Missouri Section suggesting a Student of the Year or Student Chapter of the Year award. I thought highly of the idea of the Student Chapter of the Year Award, so I worked on the proposal and it was approved by the Executive Committee. This award will be presented for the first time at next year's awards program. I sat down with Jeff Groncki, president of Illinois/Indiana Section, during their annual field trip and he proposed a national award to honor long time section members who tirelessly served, succeeding in keeping their sections both alive and growing. A similar proposal had been suggested from the Executive Committee and this proposal was worked on by a number of members and approved this fall. Our National Vice President, Jim Jacobs, suggested an award open to all media outlets that inform or enlighten the public on the important roles of professional geologists in society. This idea was incorporated into our Outstanding Achievement Award and was approved in Broomfield. When I visited the Ohio Section, President Tom Jenkins suggested inviting students to his office where geologists would expose students to the types of challenging projects they work on every day. I think this is a great idea, so I spoke about it at our advisory meeting in Broomfield. In fact, I plan on implementing this idea in my own section next spring with the Georgia Environmental Protection Division and a few environmental consulting firms.

Our 50th anniversary meeting in Broomfield was a complete success. I would like to congratulate the organizing committee for all the great field trips, technical sessions, and social events. At the opening session, I reflected on the events leading up to this anniversary, with the culmination of AIPG's first conference in 1963. Everyone that I spoke with had such a great time, and for many, the chance to meet some of our charter members was truly rewarding. These meetings are special because it brings us together, uniting us as a successful institution, and it is one of the rare times you get to see old friends from across the country. We had a number of distinguished guests this year including representatives from the European Federation of Geologists, Geosciences Canada, and Geological Society of London. Our long-time friends from the American Geosciences Institute were also in attendance. This year's technical sessions were more than impressive, and I hope they gave you a chance to expand upon your own experience or learn new areas of geology. I was honored to announce the student poster winners, and I must admit that our student members' enthusiasm can be quite contagious.

Since I've been on the Executive Committee our meeting and the Advisory Board meeting had the largest crowd I have ever seen. The section reports were mainly very positive, but we must continue to reach out to struggling sections, offering support, guidance, and resources. Congratulations to our advisory board members for 2014: Kerri Nutter, Alaska; David Pyles, Illinois/Indiana; Todd McFarland, Tennessee; and Christine Lilek, Wisconsin. I am both honored and excited to have the opportunity to work with all of you.

My term is almost up but there are a few unfinished issues to address. Our communication between National and the sections has been very good this year but there is always room for improvement. To facilitate direct communication both vertically and horizontally within the organization, I am proposing the creation of a LinkedIn group that would include all our section presidents and the National Executive Committee. I recently formed a committee of our Young Professionals and tasked them to develop ways in which our organization can encourage student members to convert to Young Professionals, and in turn, how we can help our Young Professionals in their first few years of employment. I know this will be a high priority with President Ray Talkington. One remaining issue is our climate change statement. President Ray Talkington may let the Executive Committee review the statement next year. As geologists, I think we can better serve our members and society by discussing our roles in mitigating potentially adverse impacts from global warming, such as sea level rise and salt water intrusion. We should no longer stand on the sideline. Instead, let's be proactive, have a healthy debate, and offer our assistance and expertise to policy makers.

Finally I would like to thank my wife, Holly, who often asks me ***"Where are you going now!"***

Answers:

1) The answer is choice "c" or laterites. Laterites are soils which develop in areas of high rainfall, where water seeps though the soil and leaches away nearly all of the soluble cations. Only the most insoluble iron and aluminum minerals remain. Laterites are commonly reddish soils due to their rust-red iron oxide content. Highly aluminous laterites give rise to bauxites, a globally-important type of aluminum ore.

Carbonatites are carbonate rocks of magmatic origin composed of mainly calcite or dolomite.

Stalactites are carbonate deposits found in caverns. They describe icicle-like dripstones deposited from water drops that hang from the ceiling of the cave.

2) The answer is choice "a" or felsic magma. The presence of quartz (SiO_2), potassium feldspar ($KALSi_3O_8$) and muscovite [$KAl_2(Si_3Al)O_{10}(OH)_2$] is indicative of the specimen's felsic composition, typical of rocks such as granite, rhyolite or granite pegmatites.

3) The answer is choice "b" or false.
Inoceramus is a Jurassic-Cretaceous pelecypod (an ostracean dysodont), while Turritella is a highly-spired Cretaceous-Recent gastropod. Deeper in the well we find Timanites, a Devonian ammonoid of the family Clymenidae and Geisonoceras, an Ordovician-Devonian nautiloid cephalopod. The section is not overturned, as Cretaceous rocks overlie the Devonian strata.

4) The answer is choice "b" or $\mathbf{þ} = -k/r^3 (X - x)\,\boldsymbol{i} - k/r^3 (Y - y)\boldsymbol{j} - k/r^3 (Z-z)\boldsymbol{k}$. The proof follows:
We are given:

$|\,\mathbf{þ}\,| = k/r^2$ (1)

$r = [(X-x)^2 + (Y - y)^2 + (Z - z)^2]^{1/2}$ (2)

As long as $r > 0$, we may consider the vector ř, where ř is:

$\mathbf{ř} = [(X-x)i + (Y - y)j + (Z - z)k]$ (3)

The magnitude of ř in equation (3) is $|\mathbf{ř}|$ and $|\mathbf{ř}|$ is:

$|\mathbf{ř}| = [(X-x)^2 + (Y - y)^2 + (Z - z)^2]^{1/2}$ (4)

Since equations (2) and (4) are the same, then:

$|\mathbf{ř}| = r$ (5)

$-\mathbf{ř}/|\mathbf{ř}| = -\mathbf{ř}/r$ (6)

In equation (6), the term "$-\mathbf{ř}/r$" defines a unit vector in the direction from "P' to "p" (thus, the negative sign).
It now follows that:

$\mathbf{þ}/|\mathbf{þ}| = -\mathbf{ř}/|\mathbf{ř}| = -\mathbf{ř}/r$ (7)

$\mathbf{þ} = |\mathbf{þ}| * (-\mathbf{ř}/r)$ (8)

From equation (1), we rewrite equation (8) as:

$\mathbf{þ} = (k/r^2) * (-\mathbf{ř}/r) = (-k/r^3) * (\mathbf{ř})$ (9)

If we now substitute equation (3) into equation (9):

$\mathbf{þ} = (-k/r^3) * [(X-x)\boldsymbol{i} + (Y - y)\boldsymbol{j} + (Z - z)\boldsymbol{k}]$ (10)

$\mathbf{þ} = -k/r^3 (X - x)\,\boldsymbol{i} - k/r^3 (Y - y)\boldsymbol{j} - k/r^3 ((Z-z)\boldsymbol{k}$ (11)

Equation (11) is the answer to our question, corresponding to choice "b". Again, the significance of this key equation is that it depicts a vector function which describes the gravitational field applying to our example. It can also be proven that the vector function **þ** is the gradient of a scalar function **U** where **þ = - grad U**. It follows that **þ** is everywhere normal to a surface where **U** is constant. This surface is known as the equipotential surface.

AIPG Oregon Section History

The primary impetus for licensing as professionals in Oregon takes its seeds from a long history in the search for excellence and public credibility as much as it was the collision between the old school ways of engineering, their textbooks of the 1950s and the generation of scientists.

My late father was a licensed engineer and surveyor in Oregon from 1950 forward. He was a very intelligent man and a good problem-solver his entire career. But by his own admission, the education he received at what was then called Oregon State College, taught aspiring young engineers only ONE class in soils and no geology. Regardless, they were still allowed to delve into areas where a smattering of knowledge could prove dangerous. I have seen his transcripts. Today, happily, Oregon State University has entire departments in all aspects of engineering as well as independent schools in the geotechnical world including a world class School of Oceanography. This is a delight to all of our science specialists and a benefit to the American scientific community. The point of this discussion is to show a personal and real life example of how education has changed over time to benefit the world's needs.

Intertwined in the reasoning for licensing is the public protection issue. Government desires to regulate everything where consumers might be affected and for us as professionals to be able to stand alone. The Oregon chapter fought like its counterparts in other states for years, for a singular identity, and freedom from a somewhat foreign licensing board (engineers) who held different perspectives of the geological arena. Few were aware of or prepared for the rapid expansion of the overall geological marketplace. Personally I watched engineers who lost their licenses because they weren't prepared and lacked sufficient background to meet the challenges of our part of a rapidly changing world. Most of these individuals were likely good at engineering, but ventured into the geological/geotechnical areas and encountered numerous educational "landmines." Having been raised by an engineer, and having been educated and practiced in the environmental and engineering side of geology as well as soils engineering, I have seen the difference and the pitfalls, which is why licensing exists today. It was never the production of volumes of work that mattered, but the challenges of the next problems that lay outside of the comfort box.

Founding Fathers In Oregon

Somewhere in the mid-1970s The American Institute of Professional Geologists gave birth to the Oregon chapter. Looking back at the old files is challenging as few copies of their minutes and thoughts exist. Oregon's early section roster did include a broad spectrum of specializations including, but not limited to academics from no less than six universities, private practitioners in geology, representatives from two or three state government offices and other parties with interest.

Amongst the first group we find the names of John Eliot Allen, educator and professor emeritus; Ewart M. Baldwin, educator and author; Lawrence L. Brown and Jerry Gray (not related) from government offices; Raymond E. "Andy" Corcoran, a former State Geologist; Ken Dodds, practitioner; Paul E. Hammond, an educator in mineralogy, etc.; Herbert G. Schlicker, Consultant; and many more. Some were my undergraduate professors, mentors and friends forever. We miss those that are now gone, and all for their intense love of, and contribution to this profession.

Despite the condition of the chapter files and lack of continuity at times, I thought the readers might appreciate the timelines of activity which could be reconstructed and which will become a part of the more permanent records of this chapter for future reference. Should anyone find errors, please forgive as this is as good as it gets based on current evidence.

Timeline Information Reconstructed

1969-76: National membership and employment widely spread over the areas of geology, engineering geology, geophysics, hydrogeology, mining, geochemistry, paleontology, geomorphology, petrology, and petroleum, et al.

1976: The Oregon chapter was based on 20 active members representing every sub-discipline in the sciences including academics from six universities across the western half of the Beaver State.

1977: Oregon Chapter of AIPG was in conversation with several groups regarding the status of geologists in the state and their relationships with engineers—an ongoing issue. Paul E. Hammond was the section Secretary/Treasurer until December 1, 1977 when Richard C. Kent stepped up, partially due to Paul's retirement. The Oregon Chapter retained 20 members on the roster, and Arthur F. Brunton was the National Executive Director.

The 1977 February 10, 1977 meeting of the section at Randall's Chuck Wagon Restaurant, Salem, Oregon. The "hot" topic of the day was the always present and ongoing conversation about the proposed registration of geologists in Oregon, and the possible formation of a State Department of Resource Management, which would absorb DOGAMI, the Department of Geology and Mineral Industries. Paul Hammond, a professor at Portland State University was still pushing retirement.

The December 1, 1977 minutes detailing the recent meeting of the Association of Professional Geological Scientists, Oregon Section, on November 17, 1977 in Salem, the state capital. Mr. Saleem Farooqui was elected section President for 1978. Richard C. Kent was elected to the position(s) of Secretary/Treasurer.

The 1977 "Mineral Resources Crisis Statement" was produced in the vein of industry and the profession aiding government to better see issues potentially affecting our economy and profession.

The year 1977 was a period of high activity for those in the profession posturing for AIPG, AEG and other groups interested in the state licensing matters arising in the market. The section was working hard at recruitment of new members.

1982-83: Ken Dodds was elected President, with Bob Gainer as Vice President of this 27 member section.

1982: Senate Bill 480 was formed and hot-bed discussions were flying around due to the nature of potential liability risks for professionals due to the manner of language being used. The primary concerns boiled down to the fear that such regulation would chase off Professional Geologists, Engineering Geologists, and CEG practitioners licensing from other states.

1983: National Executive Director of AIPG, Victor C. Tannehill was elected.

Continued on page 46

A Special Tribute

William J. Siok, CPG-04773

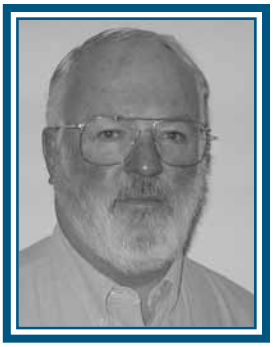
I would like to depart from my typical column focusing on professional issues or AIPG policies and activities. Those who are actively engaged in AIPG on a regular basis, particularly if there are routine dealings with AIPG headquarters, are fully aware of the excellent level of service from the headquarters staff regardless of the matter at hand.

You know that each member of the staff consistently demonstrates a most professional demeanor and competence when responding to member inquiries and requests. This is as it should be in all service organizations.

There is an AIPG staff member who received well-deserved Distinguished Service recognition at the Awards Ceremony. Wendy Davidson has been a member of the AIPG staff since her high school years when she worked in a part-time capacity. Through many years of AIPG's challenges to establish itself as a worthy representative of the geosciences profession, Wendy has been a dedicated and loyal employee. She has progressed from her first job as a clerical assistant to Assistant Director now, as befits her unswerving dedication and service to AIPG.

All you who have met and worked with Wendy know well that her discretion, competence, and sincerity are genuine and that the best interests of the Institute and its members are always foremost in her dealings with members and non-members alike.

Please join me in recognizing Wendy, the 2013 recipient of the AIPG Award for Distinguished Service, with well-deserved congratulations. The citation stipulates that the award is "For exceptional dedication, loyalty, service, and commitment to the Institute, its members, and staff."



**Compiled by David M. Abbott, Jr., CPG-04570,
2266 Forest Street, Denver, CO 80207-3831,
303-394-0321, fax 303-394-0543, dmageol@msn.com**

Topical Index-Table of Contents to the Professional Ethics and Practices Columns

A topically based Index-Table of Contents, "pe&p index.xls" covering columns, articles, and letters to the editor that have been referred to in the PE&P columns in Excel format is on the AIPG web site in the Ethics section. This Index-Table of Contents is updated as each issue of the TPG is published. You can use it to find those items addressing a particular area of concern. Suggestions for improvements should be sent to David Abbott, dmageol@msn.com

Societal Considerations as part of Geoscience Ethics Codes and Practice Guides

Every year, the American Geoscience Institute puts on a forum for the leadership of AGI member societies. This year's forum addressed *Ethics and the Geosciences*. I was asked to be one of the speakers. It was an interesting day. The discussions of ethical issues in scientific publishing delved far deeper into the topic than have been addressed in this column and are of most interest to publishers and editors.

Linda Gundersen presented an overview of the American Geophysical Union's new *Policies on Scientific Integrity and Professional Ethics* (AGU, 2013[1]). The Principles of AGU's Policies are:

Excellence, integrity, and honesty in all aspects of research

Personal accountability in the conduct of research and the dissemination of the results

Professional courtesy and fairness in working with others

Unselfish cooperation in research *Good stewardship* of research on behalf of others

Legal compliance in all aspects of research, including intellectual property

Humane approach in evaluating the implications of research on humans and animals

As indicated in the title of AGU's new policies, the integrity of scientific research and publication is the overarching theme. Following these Principles are 13 statements of Responsibility.

One of the primary documents underlying AGU's new polices is the Singapore Statement of the World Integrity Conference.[2] The Singapore Statement specifically underlies Responsibility 13, "Societal Considerations: Members have an ethical obligation to weigh the societal benefits of their research against the costs and risks to human and animal welfare and impacts on the environment and society. Members need to be aware of legal requirements in this area."

I'm a member of SME's Resources and Reserves Committee, which has been working on an update of the *SME Guide for Reporting Exploration Results, Mineral Resources, and Mineral Reserves* (the SME Guide). This update reflects the periodic review and update of similar mining codes around the world. When one professional organization updates its code, the others examine the changes to see to what extent their codes require updating to bring them in line with what others have done and also to recognize emerging issues. Although "environmental, infrastructure, social and governmental factors" have been included in the Modifying Factors that must be addressed in determining whether a mineral resource can be converted to a mineral reserve for some time, these issues, particularly social license, have become increasingly important and sometimes contentious issues for new mining properties. Therefore, the proposed new version of the SME Guide is adding new guidance to address social, health and safety, and related issues that will impact employees, contractors, neighboring communities, and customers and how these impacts will be addressed over the life of the project.

The hue and cry surrounding the expanded development of tight shale reservoirs following horizontal drilling and hydraulic fracturing completions around the country and in Europe clearly demonstrates social interest and both real and alleged impacts in the petroleum business.

The catastrophic flooding along the Colorado Front Range in mid-September has raised questions about the results of changed river channels, the ability to engineer highways and bridges to withstand the 100-year, or in this, case the 1,000-year flood. Alternatively, should we recognize that Mother Nature will win sooner or later and accept the fact that re-building will be needed now and again? Following the flash flood of July 31, 1976, US-34 through the Big Thompson Canyon was rebuilt to withstand the 100-year flood. The September 2013 flood, resulting from several days of heavy rain rather than a dump of a super-cell storm over a few hours, took out a reported 60% of the highway, including many areas rebuilt after the 1976 flood.

As I noted in column 143 (Jan '13), in October 2012 an Italian court convicted six scientists and a government bureaucrat to six years in prison because they issued "inexact, incomplete, and contradictory" information about the

1. *http://ethics.agu.org/files/2013/03/Scientific-Integrity-and-Professional-Ethics.pdf*
2. *http://www.singaporestatement.org/statement.html*

risks posed by tremors during the weeks preceding the April 6, 2009 earthquake in L'Aquila, Italy that killed over 300 people.

The point of these disparate events, which AGU recognized, is that practice across the whole range of geoscience has the potential to affect humans and their communities in many ways. As a profession, we should recognize these actual and potential impacts and appropriately address them in our professional practice guidelines and our professional ethics codes. The "'inexact, incomplete, and contradictory' information about the risks" cited by the Italian court highlights some of the major difficulties. The public wants geoscientists, or any other experts, to provide simple, easily understood, declarative statements about all topics. Uncertainties, "I don't know," and other evasive answers are unacceptable. The public's desire is both unrealistic and understandable.

Canon 2 of AIPG's Code of Ethics, Obligations to the Public, and the Standards and Rules thereunder address some of these issues. But do they do so sufficiently? Do we need to revise or add to Canon 2? Is AGU's Responsibility 13 summary of the Singapore Statement enough or is more guidance needed?

Kristina Pourtabib, SA-3410, who reviewed a draft of this column, commented, "I believe that Canon 2 of AIPG's Code of Ethics sufficiently addresses some of these issues and I don't see any reason for change or addition to the current Code of Ethics, although, the current AIPG Code of Ethics might have some room for improvement in the level of detail in the code. The code is fairly general which can lead for much interpretation in some of the statements, and it might do some good to phrase the statements in a way that would encompass more situations that could arise (I don't have anything in mind specifically)."

Pourtabib opined, "I think that AGU's Responsibility 13 summary of the Singapore Statement seems sufficient (I only have the context of this statement and don't know how the rest of their rules are laid out). They do a good job of encompassing many different scenarios that the member has to think about such as weighing the benefits against humans/animals and the environment. They phrase the statement in a way that doesn't single out any particular type of research and they also touch on the fact that the member needs to be aware of any legal requirements as well. I think that the AIPG Code of Ethics, although good, could stand to have a revision and add on a bit more detail."

Regardless of whether Canon 2 needs revision, I suggest that the geoscience profession needs to look harder at the impacts on the public's health, safety, and welfare that our profession does have. We need to write articles and sponsor discussions on these issues. These efforts are something that AIPG is very well qualified to do because our membership stretches across the profession and employer types. Please contribute your thoughts on this topic.

A Plagiarizing Book

Charles Dimmick, CPG-03886, reviews technical books for *Choice* magazine, which is sent to college librarians around the country. Dimmick recently was asked to review *Fracking: the Operations and Environmental Consequences of Hydraulic Fracturing* by Michael D. Holloway and Oliver Rudd, Wiley, May 28, 2013. Dimmick's review was:

> It is disappointing to come across a fairly well-written book on a subject in which I am interested which nevertheless violates established academic standards. After a good 20-page introduction to the basics of hydraulic fracturing, I encounter: "The following is an excellent paper written by Lloyd Hetrick from an EPA workshop and reprinted with permission." The next 20 pages, constituting 2½ chapters, is the text of that paper, with no quote marks and no indication except the beginning sentence, that none of this is the work of Holloway and Rudd. The next chapter, chapter 8, is not from Hetrick, but from a paper by Leonard Kurfirst & Colin O'Donovan, lifted in its entirety from that paper with no credit whatsoever, nor are they listed in the Bibliography (neither is Hetrick's paper). Sections of subsequent chapters may also be found on the Web with no credit given. The 200-page appendix is primarily data that may be found in other previously published sources. Not Recommended.

Choice's editors' ultimately elected not to publish Dimmick's review, which is why it is quoted in full here. The *Choice's* editors decision suggest that they failed to recognize the importance of integrity in scientific publishing found in AGU's new *Policies on Scientific Integrity and Professional Ethics*, which contains numerous references prohibiting plagiarism. I addressed plagiarism in columns 73, 76, and 77 (April, July, August 2002). Rule 4.1.1 of AIPG's Code of Ethics states, "A Member shall give due credit for work done by others in the course of a professional assignment, and shall not knowingly accept credit due another." Clearly, plagiarism is unethical.

What you do think about the authors of *Fracking: the Operations and Environmental Consequences of Hydraulic Fracturing?* What should be done about the authors and their book (they are not AIPG members). The book is being marketed for college courses. Should such a book be used in courses?

Kristina Pourtabib, SA-3410, commented, "The authors of *[Fracking: the Operations and Environmental Consequences of Hydraulic Fracturing]* should have their book not allowed to go through publication until they give proper credit to the works that were referenced. Although they were not AIPG members (so AIPG wouldn't really be able to directly do anything), I'm sure that they hold memberships to other professional organizations and that these organizations should deal with them according to their own organization's policies. I do not think a book like this should be used in college level courses or any level courses for that matter because it is sending a bad message to students. It's showing students that they can take work from others, without using proper citation, and still be able to get their work published. This is not the type of mentality that we want to instill in future scientists, or anyone for that matter." I concur.

New Georgia License Renewal Restriction to US Citizens

John Berry, CPG-4032, wrote, "I have just received in the mail several sheets of paper related to renewing my Georgia Professional Geologist's License #121. There is a new requirement that I must submit an Affidavit of Citizenship and 'secure and verifiable documents' to prove it (*i.e.* passport or drivers' license).

"I consider that one's citizenship has absolutely no bearing on one's ability to practice geology in a competent and ethical way. In fact, the State of Georgia may be depriving itself of the services of brilliant people who happen to have

permanent residence status or to not to live in the United States, in which case the Legislature has shot itself in the foot.

"In fact, I consider it unethical to practice geology in a jurisdiction which does not allow qualified people to obtain licensure regardless of their citizenship, as long as their status is legal (i.e., permanent residence, appropriate work visa, or, if they are resident outside the country, temporary licensure or licensing by reciprocity)."

A couple of other Georgia PGs brought Georgia's citizenship/legal residence requirement to my attention at the recent AIPG Annual Meeting. Their reaction to the requirement echoed Berry's comments.

The problems arising from illegal immigration have become nationwide issues and the failure or at least perceived failure of federal action has prompted many states and even some local jurisdictions to pass their own rules regarding proof of legal residency in the US. Georgia's professional licensing provides one example (amendments to O.C.G.A. § 50-36-1 became effective January 1, 2012). As Berry points out, those wishing to obtain or renew a professional license in Georgia must fill out a notarized "Affidavit Regarding Citizenship" along with copies of a "secure and verifiable document" providing either proof of US citizenship or legal residency in the US. Georgia renews licenses on a biannual basis and so the matter came to Berry's attention this year instead of last year.

Georgia can also suspend the professional license of a registrant who is in default of his/her federal student loans or has failed to pay required child support. These provisions, along with the proof of citizenship or legal residency requirements, reflect efforts to enforce socially desirable goals by adding them to professional licensing requirements. Clearly, such provisions have no bearing on the strict question of whether an individual's professional practice is competent. One could even question their effectiveness in achieving their primary goals. If one can't practice one's profession, isn't one's ability to pay back student loans or child support adversely impacted?

Georgia is home to many industrial mineral-producing properties (paper-grade kaolin and marble, ceramic feldspar, etc.). Many of the major industrial minerals-producing companies in the world are based in Europe and some of these companies own Georgia properties. The senior management geologists in these companies are European nationals living in Europe. Although they may have legal visas for their visits to properties in Georgia (or other states), it is not clear that they could obtain a Georgia geologist's license. Because their on-site geologists will have Georgia licenses, these European geologists probably don't need to be licensed. However, whether they could be easily licensed is an interesting question, one Berry asks. Do other states have similar provisions?

Field Methods: Past, Present & Future—A Personal Odyssey

The title of this topic is the title of the paper **Jim Reed**, Director of Research & Development at RockWare Inc., presented at AIPG's Annual Meeting in Broomfield. Reed contrasts the field work he did on a west Texas talc deposit in 1982-3 with his revisit to the project in 2010 as the basis for this talk. Reed points out that the 1982-3 field work took 2 years followed by 2 months of data reduction and illustration preparation while the 2010 work to 3 weeks in the field and 2 hours of office time. Reed went home after the talk and recorded a YouTube version that is approximately 16½ minutes in length. The link for this video is *http://youtu.be/mMsU-uHjYA7k*.

This video is definitely worth watching. Those of us who actually used plane tables, Leroy lettering sets, etc. will feel some nostalgia, although I'll admit that annotating drawings with a computer beats the Leroy set and GPS is sure an improvement over the plane table. What Reed demonstrates is that current methods for field data collection and data reduction allow for significant time efficiency improvement. But regardless of the methodology used, one must still think about and interpret the geology. As I pointed out in "Computers are not Substitutes for Careful Geology and Engineering" in column 145 (May '13), "[A]s useful as modern computers and software are in dealing with data, generating interesting graphics, etc., they are not a substitute for the critical geological and engineering work needed to evaluate mineral deposits [or any other geoscience problem]."

The American Institute of Professional Geologists is recruiting candidates for Executive Director to succeed the current Director who will retire in 2014. AIPG is a professional geoscience society with a membership of nearly 7000 and a dedicated staff of seven at its headquarters in Thornton, Colorado.

AIPG is a 501(c) 6 professional organization dedicated to advocacy, education and competence within the profession.

The staff under the leadership of the Executive Director has been a key element in strengthening AIPG's services to its membership and the profession of geology as a whole during its 50 year history. The Executive Director is responsible for headquarters operations, which include assuring and managing financial resources, publication of The Professional Geologist, oversight of membership services, and management of event development. The Executive Director is also responsible for maintaining excellent relationships with appropriate professional and technical societies, especially sister geoscience societies such as the American Geosciences Institute.

The successful candidate will:

- Preferably hold an advanced degree (MS or PhD) in the geosciences. An additional degree in marketing or business is considered a plus.
- Have a minimum of 15 years of technical and management experience at increasing levels of responsibility.
- Have a demonstrated record of increasingly challenging and successful leadership and management experiences.
- Have a background in fiscal management tied to annual profitability, growth, and program (services to members) expansion.
- Be a team-oriented leader with strong communication and interpersonal skills.
- Demonstrate an appreciation of policy issues affecting geoscientists and the geosciences, especially at federal and state levels.
- Demonstrate an obvious enthusiasm for service as a professional representative of the geosciences.
- Be willing to travel as needed. The responsibilities of this position often require weekend meetings and lengthy workweeks.
- Be committed to relocate to the Denver area within 6 months of accepting the position.

In addition to the specific qualifications, the AIPG Executive Committee expects the successor Executive Director to help propel AIPG to a higher level of involvement in the geosciences community and in increasing its services to members. The Executive Director must be entrepreneurial, dynamic, and able to commit to an aggressive campaign to increase membership and develop additional sources of non-dues revenue. The Executive Director is also expected to seek additional alliances and collaborative arrangements with other professional societies which will serve to benefit AIPG both professionally and financially.

The Executive Director is responsible to lead the implementation of the AIPG Strategic Plan and ensure that both AIPG leadership and AIPG membership are engaged in its implementation.

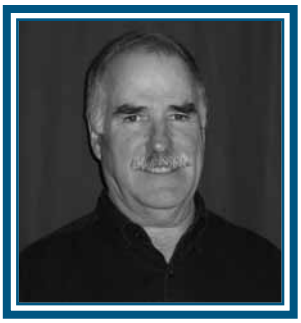
The future of all professional societies is dependent upon the younger members of the profession becoming actively involved in the governance of the societies. The successor Executive Director must vigorously engage younger members and students and encourage AIPG sections to increase section level efforts to bring young professionals into the organization.

The Executive Director will serve as ex officio board member of the Foundation of AIPG.

Salary is competitive with not-for-profit organizations of AIPG's budget and size. Applicants are required to send 1) a complete, detailed resume, 2) the names and addresses of at least four professional references, 3) and a concise two page essay outlining the applicant's interest and the applicant's concepts for expanding AIPG service to members, visibility, influence, and financial strength. Applications will be accepted until the position is filled. Review of qualified applications will begin January 15, 2014.

Mailing address:

AIPG Executive Director Search Committee
% American Institute of Professional Geologists
12000 North Washington Street, Suite 285,
Thornton, Colorado 80241



Why Does One Well Yield X While Another Yields 10X?

William J. Stone, MEM-2164

A land owner leased some acreage to a rancher from farther north who wanted warmer winter pasture for his cattle. But as soon as the herd was on the new range, the existing well went dry. Frantic, the land owner visited the state geological survey where I worked, looking for pertinent reports on his area. The receptionist stopped me in the hall and asked if I knew of any. As no one indicated this was about water, I recommended a recent coal geology report. He bought a copy and went away. However, he apparently didn't understand the report because he drilled a new well next to the dry one. Surprise, it was dry too.

Then he came back to the survey, asked to speak to someone about water availability, and was directed to me. When he told me the location of his property, I consulted the geologic map in the coal report he was clutching and saw the problem. His existing well was completed in volcanic tuff, which had amazingly yielded enough for a windmill (often as little as 3 gpm works). I suggested he drill in the adjacent area of tilted coal measures, penetrating and screening as many of the sandstones as he could afford. He still seemed confused and asked if I could come and show him. Gee, a chance to get out of the office – hard choice. We agreed to meet at his gate mid-morning, the following day.

When I arrived at the property, a drill rig was sitting there. Running. Talk about a pressure job. I saw an outcrop of the sandstone-shale-coal sequence I'd recommended. These beds dipped abruptly out of sight beneath alluvium. But in the distance, along strike, I could see the tipple of an abandoned coal mine, indicating the presence of the coal measures there. A well installed between the outcrop and tipple should encounter the sandstones at a reasonable depth. When the driller asked if I'd *witched* a good one, I nodded yes, holding back the standard rant hydrogeologists normally offer against *witching*. The new well yielded 30 gpm (10 times the rate of the original well), earning me a free hamburger at a nearby pub. I had my students come up with other scenarios where two adjacent wells would yield X and 10X respectively. There are many.

One of my colleagues always rejected the term aquifer, because he felt it didn't live up to its promise and was easily misunderstood. "Water doesn't only occur in aquifers," he'd say. I define *aquifer* as *a geologic unit whose saturated portion yields useful quantities of water to wells*. That applies here: the sandstone was simply a better aquifer than the tuff. Tip: Forget witching. Just target the most likely aquifer, based on local geology.

Happy Holidays!

Dr. Stone has more than 30 years of experience in hydroscience and is the author of numerous professional papers as well as the book, *Hydrogeology in Practice – a Guide to Characterizing Ground-Water Systems* (Prentice Hall). Feel free to argue or agree with him via email at wstone04@gmail.com.

Cover Photos Needed for *TPG*

We are looking for high resolution photos to place on the cover of future *TPG* publications.

The photo must be of high resolution and geology related.

Please email your photo, with caption to *aipg@aipg.org* for consideration. You will be notified, if your photo is selected.

Invitation from AIPG to Submit Articles

You are invited to submit an article, paper, or guest column based upon your geological experiences or activities to the American Institute of Professional Geologists to be included in "The Professional Geologist" (*TPG*) quarterly journal. The article can address a professional subject, be technical in nature, or comment on a state or national issue affecting the profession of geology.

Article submissions for *TPG* should be 800 to 3200 words in length (Word format). Photos, figures, tables, etc. are always welcome! Author instructions are available on the AIPG website at *www.aipg.org*.

Please contact AIPG headquarters if you have any questions. AIPG email is *aipg@aipg.org* or phone (303) 412-6205.

Movin' On Over

Stephanie Jarvis, SA-1495,
sjarvis@siu.edu

The first column I wrote for The Professional Geologist (*TPG*) was a guest column for the Student's Issue, Jan/Feb 2010. You might think that I saw sending a column in to *TPG* as a fun writing outlet. Or maybe there was a conversation—something I wanted to say or did not quite understand—that I wanted to have with the world of professional geology. Or, if you really overestimate my 20yr old self, you might think that I saw it as an amazing networking opportunity—a way to meet great mentors and, maybe, introduce myself to potential employers. While in hindsight all of those things are true, the real reason I submitted that first column was guilt.

Here was my dilemma: much to my surprise, I had recently been awarded with one of the AIPG National Scholarships. My understanding when I applied was that applicants were agreeing, should they become recipients, to write a guest column for *TPG*. I did not realize that this column was the actual scholarship essay until I opened the July/August 2009 issue. I was simultaneous mortified ("I didn't write that to be published!!!"), excited ("Look at me!!!"), and confused ("So…do I still need to write something for them?"). Then I started getting those emails about submitting an article, which I realized much later go out to the whole organization every once in a while. By the time October came around, this obligation-not-met feeling had stewed for a few months. I was also headed to my first GSA meeting. What better experience to write a quick article about for the Student's Issue, due November 1st, and be done with it? Thus, "Volcanoes to Vineyards, Pizza to Smoothies: A Student's Take on GSA" was borne. Vickie wasted no time—I was very quickly wrapped into filling the soon-to-be-vacated Student's Voice post. I say "wrapped" because I had no intention of doing anything of the sort and was actually not really sure I wanted to.

I recently had the pleasure of doing the same thing to Kristina Pourtabib. While sitting down to write my column for the May/June 2013 issue ("Whew!"), I was flipping through the latest *TPG* and came across her excellent guest column ("Geoscience in the Community" in Jan/Feb 2013). Knowing that my days as a student would soon be ending, I jumped on the opportunity to fill my post. Judging from her first column as the official "Student's Voice", I am confident that it is in great hands.

Thus, my four years of Student's Voicing—of taking full advantage of my Naïve Student status to tell silly stories, broach potentially contentious waters in legitimate curiosity, and ask those mundane resume questions—must come to an end. I have thoroughly enjoyed the post and I appreciate the opportunity to hold it. I will be moving on, in life and in *TPG* column-world. I have more details about the latter than the former, though I have yet to come up with a good title. My new column will be loosely focused on news-relevant geology topics—things that I feel, as geologists, we should be aware of and able to talk about. It will be research based and, I hope, more interactive with readers. So, if there are any title or topic ideas out there, send them my way.

Thank you for reading!

PAY DUES ONLINE - 2014 Dues

Annual membership dues are due and payable January 1, 2013 in accordance with the Bylaws. You are encouraged to login to the AIPG Member portion of the website to pay your dues for 2014. Paying online helps save on printing and postage costs. Credit card payments can be taken over the phone (303) 412-6205 or fax your dues statement with credit card information to (303) 253-9220, or mailing address is below. Call if you have any questions (303) 412-6205. Click on MEMBER LOGIN to pay dues, make a donation, and purchase insignia items. Your login is your email and the system has you setup your password if you haven't already. You must login to pay dues, search the directory, or make changes to your record.

Have You Given A Presentation At A Seminar, Or Annual Meeting?

If yes, then we are interested in you submitting your paper for publication.

Please contact AIPG Headquarters at ***aipg@aipg.org,*** if you are interested in having your paper being published in *TPG*.

Settling In

Kristina Pourtabib, SA-3410
pour1824@vandals.uidaho.edu

In my previous articles I discussed some issues that undergraduate geology majors are faced with, including: field camp, narrowing down your geologic interests, and figuring out how to get the most out of your time as an undergraduate. Being a young geologist, I feel that it is important to share all of the trials and tribulations that I have undergone to my fellow geologists weather the experiences were positive or negative. One of the major problems that I faced as an undergraduate, trying to navigate my way through being a geology major, was that I was unaware of the level of work and planning it took to prepare for life after undergrad. Since I came from a relatively small geology program, and not many of the other students continued with their schooling after their undergraduate degree, I wasn't able to ask my peers for advice when I decided to choose the graduate school route. Not being able to get much information from my peers I turned to reading articles or listening to geologists in academia or industry for advice. The majority of people provided more detail on the recent events leading up to their current position, but lacked in specificity when it came to explaining the choices made early in their academic life. Being a recent graduate who had just gone through the processes of making some of these important undergraduate career decisions, I feel that I should fill in some of those missing details. Since I have chronicled my geology experiences thus far, I thought my next adventure to share with my fellow *TPG* readers is the start of my fall semester as a graduate student and to provide some tips to keep in mind for anyone who decides to pursue a graduate degree.

Prior to leaving my home in Illinois and moving out to Idaho for graduate school I had very few expectations. For one, I was about to move across the country to a state that I had never visited, and thus, a campus that I had never seen in person (aside from some generic online pictures). I would definitely advise anyone who is looking into a certain graduate program or looking to work with a particular advisor to visit the campus. Fortunately for me, I got lucky and loved the campus I am currently at, but for some who move in blind it might not work out so well. You may think that the area you live in won't really make a difference, since your time will be predominantly focused on your research, but trust me; it does play a major role in your overall graduate experience. As a graduate student, you don't want to add any unnecessary stress to your already stressful new life.

My second piece of advice for anyone starting in a graduate program, is to make sure that you are really interested in the research project or area that you are focusing on. In my opinion, it is very easy for someone to fall out of love with the work that they are doing, but it is difficult for someone to fall in love with the work that they are doing if they were never passionate about their research topic in the first place. Most likely, the project that you start work on will take up the majority of your time each week for the next two to five years, so it would be in your best interest to at least somewhat like what you are working on.

Thirdly, I would advise any incoming graduate student to make sure that they are familiar with the personality and work habits of their primary advisor. If you are an independent researcher and have an advisor who likes to micromanage then it will cause both of you a lot of tension. Unnecessary tension in the workplace can have negative effects on the progress of your research, and it can also lead to reflecting badly on your reputation in the future. For instance, prior to sending out applications to graduate programs I made sure to contact the professor that I was interested in and I specifically asked what type of interactions they had with their graduate students, how frequently they met, and how they would monitor their student's progress. I was able to find a professor that met both my research interests and who let me work more independently as a student.

Although I only scratched the surface on thoughts and considerations to take into account when pursuing a graduate degree, the bits of advice listed above are all things to take note of before you start your school searches. All of this advice not only applies to graduate school but also can be applied to job application for those undergraduates who decide to pursue jobs in geology instead. When filling out applications in general, it is important to think about not only your main job but to also think about how your daily life and interactions with people are going to be. Everything can affect the progress and quality of your work, so being informed about some of the potential sources of stress that are discussed very little during your undergraduate years can be helpful. Of course there are always going to be more potential complications to think about when looking towards your life after being an undergrad, but it's always better to be overly cautious then not prepared at all.

Professional Development, Networking, and Just Plain Fun!

Michael J. Urban, MEM-1910

Perusing this issue you may have been drawn in by the title of this article and you're reading to see where I'm going here. I hope this is the case and encourage you to read on. Where can you find professional development, network with colleagues, and have fun all at the same time? Well, at GSA, of course! [GSA is the Geological Society of America, in this case, the 2013, 125th Anniversary Annual Meeting.] Following on the heels of AIPG's 50th Annual National Meeting this year, GSA took place in Denver, Colorado, in October. Some colleagues and I presented a couple of posters, but the true highlights of the meeting relate to the three things specifically identified in this article's title: 1) professional development; 2) networking; and 3) fun.

Well sure, some of my colleagues joke about conferences affording them a chance to visit golf greens across the country (or world), but in reality, most educators are life-long learners who relish opportunities to learn more about anything they're interested in. For me, the chance to attend a major conference like GSA is exciting and well worth the time commitment. Given my predilection toward the topic of planetary science, I attended a number of presentations at GSA this year about some of the extraordinary findings from missions to places like Titan, asteroid 4 Vesta, and the icy moons of Jupiter and Saturn (some of these icy moons may hold untold astrobiological wonders). Lectures about the dunes on Mars and fractures in the icy crust of Enceladus (moon of Saturn) bring geology to a whole new level – figuring out what's happening on distant worlds by applying our understanding of the Earth. Attendance at GSA provides refreshing professional development. Much of the information shared in these lectures is cutting-edge, and it's quite thrilling to be present for the introduction of new, and occasionally controversial, ideas and theories in science.

Believe it or not, one learns far more than just the expected content facts at these presentations. Spectators and participants alike pick up lessons in public speaking too. Whether a given speaker is a dynamic lecturer or a soft-spoken, tongue-tied scholar, there is a wealth of social information to behold: for example, the unmitigated gall and unbridled arrogance of some in the audience, as they patiently await their turn to pounce on unsuspecting or susceptible presenters when sufficient time for questions is allotted afterward. It's enjoyable watching confident speakers deflect and adequately foil these often ill-willed attempts for airtime, and I squirm right alongside the uncomfortable and awkward presenters who recoil at such attacks. This kind of professional sparring, undoubtedly part of the long-held peer review ritual, is often a sight to see. Great fun! Well, certainly engaging anyway. I make light of it here, but in reality the communication of these ideas and their subjection to scrutiny are essential to the true advancement of science. Where would we be if ideas were never challenged? We might all have non-functioning cold fusion reactors in our homes.

A case for both professional development and fun at GSA has been made, but what about networking? While standing for a few hours near the posters I co-presented (on two different days), plenty of time abounded to visit with neighboring poster presenters and passersby. Since posters are grouped by theme, the other presenters in my aisle shared similar interests and I gained a great deal of insight into a plethora of geology and geoscience education topics. A few business cards were exchanged during chance encounters, and fingers-crossed I'll hear back from one or two of them at some later date. I view the poster session interactions as a mosaic of random small group think-tanks, spurring imagination and leading to individual innovation. On more than a single occasion I have had a light bulb go off in my head and been turned on to a particular avenue of further investigation.

For me, another great thing about GSA in Denver (not far from where I went to grad school) is bumping into former professors and former graduate student office mates. This time around I visited with three of my professors and saw two other professors from afar. An anomalous encounter with one of the guys I attended graduate school with will likely lead to a grant application to bring him back to my college to provide a summer workshop for my students. [Did I mention service opportunities too? One can sit at the AIPG booth and help Vickie out for a couple of hours!]

Teachers, community college instructors, university professors, and industry professionals alike can and should consider attending professional conferences once in a while. A side benefit of geology conferences or annual meetings, such as GSA and AIPG, is the opportunity to participate in local and regional field trips accentuating some of the fantastic landscape and formations of North America's unique geology. Grants and scholarships are some of the resources available to teachers and other educators who do not have access to the funds necessary to attend these kinds of events. Pick a meeting you think looks interesting and then find a way to make it happen. You won't regret it!

Featured Resource:

This issue's featured resource is the Geoventures web page: *http://www.geoventures.org/*

Find a variety of field trip opportunities through the *Geological Society of America's* Geoventures website. They offer field trips specifically for teachers, students, rockhounds, geoscientists and more, and provide financial support opportunities for teachers. Many other geologist organizations, including AIPG, provide excellent field trip opportunities.

Dear Editor

A complete list of the OEST winners for the 2013 NAGT OEST program is enclosed. On behalf of NAGT, than you and your organization for bringing additional visibility and stature to geosciense education through your support of NAGT's award program.

OEST Committee, NAGT

The American Institute of Professional Geologists has agreed to provide a one-year subscription to *The Professional Geologist* to the following winners:

Eastern Section and Virginia State-
Russell H. Kohrs.
Pacific Northwest Section-
Helen Farr
New England Section-
Erica Wallstrom
Central Section-
Mary Lestina
Southeastern Section-
Oliva Boykin
Southwest Section-
Cheryl L. B. Manning
North Central-
Rod Benson
Midcontinent Section-
Kathy Rusert
Far Western Section-
Herman Hilkey
Texas Section-
Gary Poole
Texas State-
Katie Wagner
Alaska State-
Jonathan Smith
New York State-
Michael Wing
New Jersey State-
Steven Carson
Alabama State-
Alison Starr
Louisiana State-
Lacey Hoosier
Arizona State-
Jeremy Williams
North Carolina State-
Mary Catherine Mills
Georgia State-
Nancy E. Adgate

50th Annual Meeting Comments

Dear Ron and Bill:

Just a short note of thanks to AIPG and you for the dinner on Thurs. night and for the package of momentos given to me as a Charter Member 50 years later. I have thoroughly enjoyed refreshing my memory of the founding meeting in the Library Auditorium on the Colorado School of Mines Campus as presented in Richard Proctor's AIPG History Book. And of course many of the articles by authors describing the importance of professionalism in our daily work and contributions to society.

At the Founding Meeting when membership was discussed, the people who had carried the load were in favor of a monolithic one class of members with a minimum of 12 years of professional experience. Those of us in favor also of a student membership lost the vote and it was a long time before that was corrected. At the Thursday meeting I was delighted to learn about a new award to be given annually to the best Student Chapter. What goes around comes around.

Congratulations on a memorable occasion enjoyed immensely by Ruth and me. And we are grateful to both of you for all of your fine work on behalf of AIPG, a truly unique organization. Best wishes to Bill upon his retirement after a successful tenure as Executive Director.

Warm regards,
Bob Weimer, CPG-00098
AIPG Charter Member

Dear Management & Staff:

As I travelled home after attending the AIPG 50th Anniversary Conference in Broomfield, I considered the outstanding excellence of the meeting. Obviously the meeting was, in all respects, well planned, organized and carried out. I thoroughly enjoyed it and realized that it was probably the most fulfilling meeting of its kind that I had ever had the pleasure of attending.

Consequently I strongly felt my need, as a long-time active member of AIPG, to express to all of you my appreciation of the expert hard and dedicated work all of you performed in putting on this great meeting.

Also, I do especially wish to acknowledge my personal appreciation and sense of pride in the way the charter members of this fine organization were honored at the meeting.

Thank you all very much.

Sincerely,
Glen L. Faulkner, CPG-00635

Dear Bill and Wendy,

Thank you very much for the beautiful Charter Member Plaque and handsome pen.

I sorely missed not being able to attend the celebration dinner at the annual meeting.

Sincerely,
Dean Kleinkoff, CPG-00593

Student Poster Contest Winners!

Five cash prizes were awarded to three undergraduate students and two graduate students at the AIPG 2013 Annual Meeting in Broomfield, Colorado. The undergraduate student awardees were: 1st Prize - $500 - Stephanie Gallegos, Metropolitan State University of Denver, Colorado, *New Suspected Kimberlite: Northern Colorado;* 2nd Prize - $150 - Joseph Mohan, SA-2094, Central Michigan University, Michigan, *A Paleoenvironmental Analysis of the Middle Devonian Gravel Point Formation, Western Michigan;* and 3rd Prize - $100 - Taylor Sting, SA-4756, *PM Environmental/Michigan State University, Michigan, Ferrous Sulfate Effects on High pH Soils.* The graduate student awardees were: 1st Prize - $600 (sponsored by the AIPG Colorado Section) - Keryn Wolff, SA-3664, University of Adelaide, South Australia, *Carbonate Geochemistry of Yorke Peninsula, South Australia* and 2nd Prize - $250 - Eve Iversen, SA-4523, Iowa State University, IA, *Limitations of GIS in Mapping Papyrus Along the Egyptian Nile River.*

Congratulations!

Steve Maslansky Wins Individual Safety Advocate Award

Steve Maslansky, CPG-04431, of Prescott, Arizona, has received the National Ground Water Association's Individual Safety Advocate Award, which recognizes a person who has made significant contributions to promoting, improving, maintaining, and enhancing safety in daily working operations.

The award will be presented this December during the 2013 NGWA Groundwater Expo and Annual Meeting in Nashville, Tennessee.

Maslansky retired in 2012 from his own company, Maslansky Geoenvironmental, with locations in Prescott and White Plains, New York.

Among Maslansky's contributions to safety within the groundwater industry are:

- Chairing NGWA's Safety Committee from 1983-1987 and 2002-2009
- Teaching NGWA courses and giving NGWA presentations, including 60 week-long courses on health and safety at hazardous waste sites.

Maslansky also volunteers as a HAZMAT specialist for the Prescott Area Hazardous Materials Response Team.

Michael Gefell of ARCADIS wins 2013 Technology Award from the NGWA

Michael Gefell, CPG-10758, principal hydrogeologist with the Lakewood, Colorado, office of the engineering, consulting, and management firm ARCADIS U.S. Inc., has received the 2013 Technology Award from the National Ground Water Association.

The award, which recognizes an individual's major contributions to the groundwater industry in the development of ideas, tools, and/or equipment, will be presented at the 2013 NGWA Groundwater Expo and Annual Meeting taking place this December in Nashville, Tennessee.

A 24-year veteran of the groundwater industry, Gefell helped develop the "Zipliner," a new plastic soil and sediment sampling liner that works with direct-push or manual tooling. A unique feature of the Zipliner is that it can be opened without a sharp blade, making it safer to use. Gefell's ARCADIS colleagues in the United Kingdom invented the Zipliner in 2010, and he worked to develop, test, and patent it in the United States, where it was brought to market in late 2012.

"I sincerely hope that Zipliner will help reduce injuries and losses, and make direct-push technology safer for everyone," Gefell said.

Arthur E. Becker Receives NGWA Robert Storm Interdivisional Cooperation Award

Former National Ground Water Association President Arthur E. Becker, CPG-09001, MGWC, of Manahawkin, New Jersey, has received NGWA's 2013 Robert Storm Interdivisional Cooperation Award.

The Storm Award, which is given for promoting collaboration, enhancing cooperation, and fostering community among all groundwater professionals within NGWA, will be presented in December during the 2013 NGWA Groundwater Expo and Annual Meeting taking place in Nashville, Tennessee.

A 41-year veteran of the groundwater industry, Becker is general manager of the environmental drilling division of SGS North America Inc. in West Creek, New Jersey. He served as NGWA's president in 2011.

ARCADIS wins Groundwater Remediation Award from NGWA

The engineering and consulting firm ARCADIS received an Outstanding Groundwater Project Award from the National Ground Water Association for excellence in restoring contaminated groundwater.

The award-winning project, Protection of Public Supply Well Installation Relative to Superfund Sites, was given for ARCADIS' role in:

- Remediating a Superfund site in Saegertown, Pennsylvania
- Augmenting a local water supply with a new source
- Protecting a local groundwater supply network from surrounding contamination.

A unique accomplishment of this project is that the location of the new supply well is on a previously delisted Superfund site located adjacent to an active Superfund site. The expanded water supply system increased the water system's pumping capacity by 24 percent, ensuring that industries operating within the community had the necessary resources to expand into the future.

The clean-up area, designated the Saegertown Industrial Superfund Site, involved four industrial facilities covering a 100-acre area.

ARCADIS receives Groundwater Protection Award from NGWA

The engineering, consulting, and management firm ARCADIS won an Outstanding Groundwater Project Award from the National Ground Water Association for outstanding science, engineering, and innovation in the area of protecting groundwater.

This award recognizes ARCADIS' innovations and advancements in the Idaho project Numerical Analysis of Groundwater/Surface Water Interference at Blackfoot Bridge.

The project involved an open pit to mine phosphate ore. Such mining has the potential to impact surface water and groundwater resources through the release of metals such as selenium and other constituents into the environment. Moreover, the Blackfoot River in the area is designated as a Special Resource Water needing protection to maintain outstanding characteristics and current beneficial uses.

ARCADIS developed a numerical groundwater flow and contaminant fate-and-transport model to support the impact analysis for the Environmental Impact Statement. A Record of Decision has been issued by the U.S. Department of Interior permitting the development of the open pit mine. The key component of the impact statement that led to acceptance of the proposed mine was the complex three-dimensional flow-and-transport model that ARCADIS developed.

Moving forward, the client has selected laminated geosynthetic clay liners (GCLs) consisting of a layer of natural clay woven between two layers of synthetic cloth for reclamation. This will be the first time that laminated GCLs will be widely used in a western phosphate mine, making the Blackfoot Bridge an environmentally advanced mine.

The numerical analysis on the groundwater and surface water interference also was recognized in the academic field. ARCADIS was invited to present the Blackfoot Bridge project analysis in different international conferences such as the International Conference of the Geological Society of America and the NGWA Groundwater Summit.

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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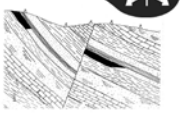

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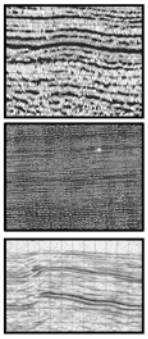

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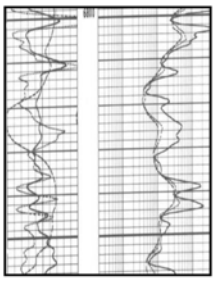

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Geology is Interesting

Erik H. Schot, PhD, MEM-2189
Email: erikschot@aol.com

The article, "Is Geology Interesting," by William J. Siok in the Sept/Oct 2013 issue of *TPG* is both thought-provoking and interesting. So is Geology! I chose to study geology because it interested me profoundly. I believe, all of my colleagues who studied geology did so also for the very same reason.

To be sure, Geology doesn't have astronomy's Carl Sagan, nuclear chemistry's Marie Sklodowska Curie, architecture's Frank Lloyd Wright, and medicine's Jonas Salk. Geologists, however, have the likes of:

1. Georgius Agricola (1494-1555), the father of mineralogy and author, a.o., of "De Re Metallica," a treatise on mineralogy, mining and metallurgy, and "De Natura Fossilium."
2. Nicolas Steno (1638-1686), who gave us the Laws of Superposition, Original Horizontality, Lateral Continuity, and Constant Angles (crystallography), and recognized fossils as the remains of once living, i.e., extinct, organisms.
3. James Hutton (1726-1797), the father of uniformitarianism, who recognized from observations in the field, that the earth had to be far older than 6,000 years, the age proposed for it by Bishop James Ussher. He recognized the geologic processes of erosion, deposition, uplift and subsidence, as well as igneous intrusion and extrusion (volcanism).
4. Jean Leopold Nicolas Frederic "Georges" Cuvier (1769-1832), the Father of Vertebrate Paleontology, who established the Principle of the Correlation of Skeletal Parts and the basic Principles of Biostratigraphy.
5. William "Strata" Smith (1769-1839), who gave us the Principle of Faunal Succession, and published the first geologic map of England, until then the largest geologic map ever published.
6. Charles Lyell (1797-1875), the father of modern geology, who popularized James Hutton's concept of uniformitarianism, and author of "The Principles of Geology: Being an Attempt to Explain the Former Changes of the Earth's Surface by Reference to Causes now in Operation." He became so famous, that he was knighted and buried at Westminster Abbey. In 1831, Charles Darwin took a copy of Lyell's book with him on his expeditionary voyage on the HMS Beagle.
7. Jean Rudolph Louis Agassiz (1807-1873), the father of glaciology, and author of "Etudes sur les Glaciers" (Studies on Glaciers: 2 Volumes). During his time at Harvard University, as a Professor of Zoology & Geology, he became one of the best-known scientists in the world!
8. Charles Robert Darwin (1809-1882), the gather of the theory of evolution (through natural selection) and author, a.o., of the "Origin of Species." He became so famous, that he was knighted and buried in Westminster Abbey "next" to the likes of Sir Isaac Newton, the world-famous physicist and mathematician, and Sir Charles Lyell, the Father of modern Geology.
9. Alfred Lothar Wegener (1880-1930), the father of continental drift, and author of "The Origin of Continents and Oceans."
10. Norman L. Bowen (1887-1956), who gave us Bowen's Reaction Series, and authored "Evolution of the Igneous Rocks," the geochemical and geophysical foundation for the study of igneous rocks and their mineral assemblages.
11. Victor Moritz Goldschmidt (1888-1947), together with Vladimir Vernadsky, the father of modern geochemistry, and author of "Geochemistry."
12. Arthur Holmes (1890-1965), the father of modern geochronology, author of "Age of the Earth," and promoter of continental drift/seafloor spreading/plate tectonics.
13. Paul A. Ramdor (1890-1985), together with Hans Schneiderhoehn, a pioneer and father of ore microscopy, recognized by both his peers and students as "Erzvater," i.e., " Father of Ore Minerals," who demonstrated that many stratiform sulfide deposits are sedimentary in nature and that the Witwatersrand Gold Deposit in South Africa is a placer deposit. He is the author of "The Ore Minerals and their Intergrowths."
14. Stephen Jay Gould (1941-2002), who together with Niles Eldridge formulated the evolutionary Principle of Punctuated Equilibrium. Gould did much to popularize geology, especially the subject of evolution, through numerous appearances on Television (PBS, CNN & NBC) and by writing 300 popular magazine essays for "Natural History," many of which were later reprinted and published in book-form.
15. G. Brent Dalrymple (1937- . . .), together with Allan Verne Cox and Richard Doell, the father of the geomagnetic polarity reversal time scale, which furthered the theory of seafloor spreading/plate tectonics. He equated their "discovery" with the discovery of physic's subatomic particles and geneticists' DNA.

Reference:

Years and numbers came from *www.wikipedia.com*.

Looking back at the accomplishments of the aforementioned scientists, we geologists have a lot to be proud of. Many of them didn't start out as geologists, but became fascinated with geology once they were introduced to it. While it is true that no geologist ever received the Nobel Price, Sir Charles Robert Darwin as well as G. Brent Dalrymple and his co-workers would well have been worthy of it.

The author received both his B.Sc. & M.Sc. degrees in Geology from the Missouri School of Mines & Metallurgy in Rolla, Missouri, in 1961 and '63 respectively. From 1963 till 1965, he served as an officer in the U.S. Army, Corps of Engineers. In 1973, he received his PhD degree in Geology/Mineralogy from the University of Heidelberg "magna cum laude." From 1973 till 1983, he worked as the Senior Petrologist for the U.S. Dept. of Energy, a Senior Geologist for Bendix Field Engineering, and a Staff Geologist for Mobil Exploration & Production Services (MEPSI). In the mid-1990s, he was an "adjunct" at Broward Community College, Broward County, Florida, for five semesters and teaching Laboratory courses. He has been a registered Professional Geologist in the State of Georgia since 1976/77.

Is Geology Interesting? You Bet It Is!

Raphael Ketani, CPG-09003

However, I could not always say this. I started out as an automotive engineering major at Bradley University in Peoria, Illinois. I soon changed majors to geology when I discovered that I was not much of a mathematician and my aptitude tests strongly pointed me in the direction of the sciences. Thus, having taken Geology 101 – Physical Geology – and realizing that I wanted a broader geology curriculum, I transferred to the State University at Fredonia, New York.

Once at Fredonia, I took more than the minimum 30 credit hours for a geology major. I deliberately attended as many geology classes as I could fit into my overall college schedule during the seven semesters and one summer which led up to the Bachelor of Science. It was a traditional geology education. However, it gave me a very firm knowledge base upon which to build. I have to say that I certainly learned a lot during those years and I always had the intention of going on to graduate school. At the time, where the money for graduate school would come from was not clear.

So, I went off to graduate school at Eastern Kentucky University where I again took much more than the required 30 credit hours of courses. I built upon the foundation I had established while at SUNY Fredonia and took a broad variety of courses, as I was intent upon preparing myself for a career in the oil and gas industry. While my undergraduate education resulted in the "planting of the seeds" of understanding, my eyes did not truly open to the world of geology until I was exposed to the information contained in my graduate courses. In fact, my understanding of the geology in front of me and the acceleration of my love of geology did not begin until the professors took us to the field to see the outcrops first hand. It cannot be said lightly that the best professors were the ones who took us out into the field over and over again. Not only did my exposure to the outcrops teach me firsthand the nature of the rocks, but this also "sharpened my eyes" and made me a trained observer – which has made me valuable to my employers.

I left the oil and gas industry long ago, but my enthusiasm for geology has kept on growing. My present work does not have much to do with geology. However, I take as many opportunities as I can to get back into the field. I go to my various oil spill sites to see whether the spills are being remediated and I take a good look into the excavation pits to see what the contractors have uncovered. You never know what interesting things will come to light in an overbuilt city like New York! So, I closely examine the sidewalls of the holes and view the new exposures of sedimentary bedding and rock. Once I'm done, I stop on my way back to the office at as many construction sites as possible to peer through the gaps in the plywood barriers and spy upon the excavations taking place. Some people stare back as they pass me and wonder what I'm doing. I explain to them – "I'm a geologist and I'm looking at the rocks."

Raphael Ketani holds a B.S. and a M.S. in geology. He has worked as a geologist for 33 years. His work experience has covered the specialties of oil and gas exploration, hydrogeology, and lately oil spill remediation. He is a AIPG CPG and a member of the AAPG, NWGA and SEPM. When not supervising oil spill cleanups, you can find him explaining the drilling of the Marcellus Shale to willing listeners.

AIPG History

AIPG Members at the AIPG Colorado Section Booth in Reno, Nevada, 2002. From left to right, John Kaufman, CPG-07409, Tom Fails, CPG-03174, Susan Landon, CPG-04591, Larry Austin, CPG-05181, and Adam Heft, CPG-10265.

Tim Cullen, CPG-07027, Michigan Section member, passed away suddenly on September 7, 2013. He leaves behind his wife Claire and daughter Abby.

Tim was a 25+ year member of the Michigan Section, having been a part of the Michigan Section since 1986. He arrived in Michigan in 1981 after spending his formative years as an Engineering Geologist on the East Coast (DC, Baltimore and Boston). He had said that it was quite a shock to arrive in Ann Arbor after spending the previous 6 years on various rapid transit tunneling projects and not see a rock that qualified for outcrop status.

He became quickly immersed in various projects: Midland Nuclear Power Plant: site dewatering, Category I Structure underpinning (sort of tunneling); G-T-G Project in New Plymouth, NZ: pre-construction site dewatering to name only a few. This was followed by a variety of projects that kept him on the road and living out of a suitcase. Tim has worked for several consultants based in Michigan on projects that included foundation studies; soil and groundwater contamination and remediation; environmental site assessments; as a Field Geologist, Project Manager and Principal.

In 1995 Tim was offered a position at the University of Michigan (U of M) with the Occupational Safety and Environmental Health (OSEH) Department. During his tenure at U of M, he managed various programs, including: Hazardous Materials Management, Environmental Protection and Permitting, Hazardous Materials and Remediation Services. At the time of his retirement he concentrated his efforts into the environmental protection efforts at the University and was the Manager of the OSEH, Environmental Protection & Permitting Program. He was a great supervisor, mentor, and friend to many throughout the university, consulting, and regulatory community.

Tim retired from the U of M OSEH Department on August, 30, 2013. He died a very short time later on September, 7, 2013.

Tim was a long-standing member of AIPG. He had served as Michigan Section Secretary in 2012. Tim also was a member of MAEP and served two terms as president of that organization.

He will be greatly missed…

Walter Henrichs, CPG-00688, one of Arizona's best known mining geologists, passed away on Thursday, October 10.

Photo of Lee Allison presenting the Arizona Geological Society's Honorary Lifetime Membership to Walt in 2008. Walt was one of the founding members of AGS, which celebrates its 60th anniversary this year. He's been a leader in the professional community, the mining industry, and science education efforts.

AIPG History

AIPG Charter Members at the 2003 AIPG Honors and Awards Banquet. Ernest Lehmann, CPG-583, John Rold, CPG-448, John Haun, CPG-136, and Keith Murray, CPG-446.

IN MEMORY

Thomas W. Angerman
CPG-02041
Member Since 1969
2013
Oakmont, Pennsylvania

Timothy R. Cullen
CPG-07027
Member Since 1986
September 7, 2013
Farmington Hills, Michigan

Robert D. Dougherty
CPG-02103
Member Since 1970
February 18, 2013
Great Bend, Kansas

Walter Heinrichs
CPG-00688
Charter/Emeritus Member
Member Since 1965
October 10, 2013
Tucson, Arizona

Charles J. Krohn
CPG-08482
Member Since 1992
January 1, 2013
Alex, Oklahoma

Request For Nominations

The 2014 AIPG Awards Committee is seeking nominations for future recipients of the Ben H. Parker Memorial Medal, the Martin VanCouvering Memorial Award, the JohnT.Galey, Sr. Memorial Public Service Award, and Honorary Membership. The qualifications for these awards can be found below. Nominations for these awards, accompanied by supporting statement, should be sent to AIPG Headquarters, c/o Honors and Awards Chr., 12000 Washington St., Ste. 285, Thornton,Colorado 80241-3134.

BEN H. PARKER MEMORIAL MEDAL

The Ben H. Parker Memorial Medal is the Institute's most distinguished award. It was established by the Executive Committee in 1969 in posthumous honor of a truly great leader, who devoted much of his life to improve the quality of geology and geologists and the services they provide. The medal is awarded to individuals who have long records of distinguished and outstanding service to the profession.

The most important criterion for this medal is a continual record of contribution to the profession of geology. A wide variety of contributions can be considered, such as (a) the education and training of geologists, (b) professional development of geologists, (c) service to the Institute, (d) leadership in the surveillance of laws, rules, and regulations affecting geology, geologists, and the public, and (e) activity in local and regional affairs of geologists.

MARTIN VAN COUVERING MEMORIAL AWARD

The Martin Van Couvering Memorial Award was established by the Executive Committee in 1979 in posthumous honor of the first president of the Institute. Martin Van Couvering made the presidency a full-time occupation for the first two years of the Institute's history. His dynamic leadership, diplomacy, and organizational abilities established the solid foundation from which the Institute has grown. Few, if any, have given so much to the Institute.

The most important criterion for the Martin Van Couvering Memorial Award is service to the Institute. As in other awards, a wide variety of contributions to the Institute may be considered. By far the most important contribution a geologist can make to the Institute is that of time. It is the contributions by individuals to the Sections, the committees, and special projects that enable the Institute to enhance the practice of geology.

AWARD OF HONORARY MEMBERSHIP

Since 1984, AIPG has conferred Honorary Membership to those who have an exemplary record of distinguished service to the profession and to the Institute.

JOHN T. GALEY, SR., MEMORIAL PUBLIC SERVICE AWARD

The American Institute of Professional Geologists' Public Service Award was established by the Executive Committee in 1982 in recognition of one of its primary purposes: service to the public. In 1992, it was renamed the John T. Galey, Sr., Memorial Public Service Award, in posthumous honor of our fourth President, whose long professional career was a continuum of service to both the geological and the general public.

Recognition of public service is important because so many Members have distinguished themselves and the Institute by giving expert testimony to governmental commissions and committees, and by providing geological expertise where it was needed by the public at large.

The application of geology to the needs of the general public may be in many different forms. Recipients of this award have outstanding records of public service on the national, state, or local level well beyond their normal professional responsibilities.

OUTSTANDING ACHIEVEMENT AWARD

The Outstanding Achievement Award was established by the 1989 Executive Committee to honor a non-member of AIPG who is widely recognized as a major contributor to the profession of geology. The award is not necessarily given annually, but only when the Awards Committee recommends an outstanding candidate to the Executive Committee for their consideration.

In 2013, the Executive Committee voted to expand the scope of the award to include candidates engaged in all types of media that inform or enlighten the public on the roles of professional geologists and the geosciences in society. This award may be for work in any media such as visual (television, film, webcasts), auditory (radio, pod casts), or printed (books, articles, websites). The work must have been completed within five years preceding the award nomination and the nominee may be an individual, a group, or company.

American Institute of Professional Geologists
Nomination form for 2014 AIPG Awards

(Please check one)

- ☐ Ben H. Parker Memorial Medal
- ☐ John T. Galey, Memorial Public Service Award
- ☐ Martin Van Couvering Memorial Award
- ☐ Award of Honorary Membership
- ☐ Outstanding Achievement Award

NAME OF CANDIDATE: Telephone: .
Address: Fax: .
Address: E-mail:

NAME OF PERSON MAKING THE NOMINATION: Telephone:
Address: Fax:
Address: E-mail:
Signature: Date:

Supporting Statement (In brief here, please submit detailed letter of support):

RETURN TO: AIPG, Attn: Awards, 12000 Washington St., #285, Thornton, CO 80241. Ph. 303-412-6205 Fax: 303-253-9220
DEADLINE: Completed nominations must be received by January 20, 2014.

AIPG along with sister societies, AGI, AASG, AEG and GSA exhibited at the National Convention of State Legislators (NCSL), in August in Atlanta, Georgia.

Good conversations with Legislators and the like to explain why Geology is important to each and every one of us.

Pictured left to right are Kasey White, GSA; Maeve Boland, AGI; Jim Kennedy, AASG; and Matthew Howe, AEG. Also representing AASG was Jon Arthur, (below left answering questions). AIPG President Ron Wallace, (below right) and Membership Service Manager, Vickie Hill represented AIPG.

AIPG Student Chapters

Bowling Green University
Founded in 2004
Chapter Sponsor:
Robert K. Vincent, MEM-0216

Central Michigan University
Founded in 2003
Chapter Sponsor:
Eric Wallis, CPG-09518

Colorado School of Mines
Founded in 1999
Chapter Sponsor:
Graham Closs, CPG-07288

Columbus State University
Founded in 2011
Chapter Sponsor
Ron Wallace, CPG-08153

Eastern Michigan University
Founded in 2006
Chapter Sponsor:
Walter J. Bolt, CPG-10289

Georgia Southwestern State University
Founded in 2013
Chapter Sponsor:
Ronald Wallace, CPG-08153

Georgia State University
Founded in 2005
Chapter Sponsor:
Ronald Wallace, CPG-08153

James Madison University
Founded in 1998
Chapter Sponsor:
Cullen Sherwood, CPG-02811

Ohio State University
Founded in 2004
Chapter Sponsor:
Thomas Berg, CPG-08208

Metropolitan State University of Denver
Founded in 2013
Chapter Sponsor:
David M. Abbott, Jr., CPG-04570

Temple University
Founded in 2006
Chapter Sponsor:
Dennis Pennington, CPG-04401

University of California-Davis
Founded in 2010
Chapter Sponsor:
James Jacobs, CPG-07760

University of Georgia
Founded in 2011
Chapter Sponsor
Ron Wallace, CPG-08153

University of Nevada-Reno
Founded in 2008
Chapter Sponsor:
Jonathan G. Price, CPG-07814

University of South Dakota
Founded in 2013
Chapter Sponsor
Derric Iles, CPG-10986

University of West Georgia
Founded in 2010
Chapter Sponsor:
Eric Lowe, MEM-0385

Wayne State University
Founded in 2012
Chapter Sponsor:
John Barkach, CPG-09121

Wright State University
Founded in 1996
Chapter Sponsor:
Thomas Berg, CPG-08208

AIPG Hawaii Section History

The Hawaii Section was started by Mark Rogers in early 2003. Mr. Rogers relocated to Honolulu, HI from Anchorage, AK in 2001, where he had previously served on the Alaska Section Executive Committee (ExCom). The Hawaii Section has supported the American Institute of Professional Geologists (AIPG) National ExCom through Mark Rogers' as technical presenter at the 41st Annual Meeting in Lexington, KY (2004), participation in the CPG Practicality Committee in 2005, as National Secretary (2006-2007), and as National Advisory Board Representative (2008-2009).

At its inception in 2003, the Hawaii Section had a total of 12 members which included:

Glenn Bauer – State Geologist (CPG-10855), Kenton Beal (CPG-09107), Robert Chenet (CPG-10225), Harold Clark (CPG-09042), Benjamin Collins (CPG-07066), John Lockwood (CPG-09806), Dennis McElrath (CPG-08131), John Mink (CPG-01693), Jan Reichelderfer (CPG-08150), Raymond Robeck (CPG-00013), Mark Rogers (CPG-08926), and Glenn Shepherd (CPG-01019). Currently, the Hawaii Section has a total 13 members which include six original members (G. Bauer, K. Beal, R. Chenet, M. Lockwood, D. McElrath, and J. Reichelderfer) plus Kevin Gooding (CPG-10856), Troy Rosenbush (CPG-10977), Charles Begeal (MEM-2365), Ning Li (CPG-10761), Christine Meyer (AS-0051), Conrad Stephenson (CPG-07076), and Mark Weber (CPG-02821).

The Hawaii Section has been well represented in state government. The Hawaii State Geologist was Glenn Bauer (CPG-10855) until his retirement in 2008. Hawaii, however, is still one of few states that has not established a state board to license geologists. From 2006 – 2008, Mark Rogers worked with Kenton Beal and several Hawaii state representatives in lobbying the state house / senate to adopt National Association of State Board of Geology (ASBOG) as a means of establishing a state board for licensing geologists. These legislation efforts to adopt ASBOG eventually failed in late 2008 as the state house responded "that the protection of public health and safety was adequately maintained by the Department of Natural Resources (Glenn Bauer's former office) and the USGS' Mauna Kea field office on the island of Hawaii".

The Hawaii Section has had meetings, and hosted field trips over the years. From 2003 until late 2008, the Hawaii Section hosted five to six meetings a year at various locations in Honolulu, as well as meetings at the University of Hawaii – Manoa campus. State officers have included Mark Rogers (president 2003-2005 and 2008), Kenton Beal (president 2006-2007), and Robert Chenet (vice president 2005-2008). The Hawaii Section has since gone inactive, due in part to Mark Rogers' relocation from Hawaii to California in late 2008.

Geoscience Online Learning Initiative (GOLI) - AGI/AIPG

You, as an AIPG Member, are invited and encouraged to submit a presentation to be given online for the Geoscience Online Learning Initiative (GOLI). AGI and AIPG have teamed up to build a portfolio of online learning opportunities to help support the professional development of prospective and early-career geoscientists as well as addressing topics of interest to the broader geoscience profession. GOLI courses support both synchronous and asynchronous online learning, and count toward continuing education units (CEU's).

A $200 stipend and 10% share of registration fees are provided to the presenters (details on presenters guide).

If you are interested please read the GOLI - AGI/AIPG Presenters Guide and Guidelines and Suggestions for Webinar Presentations on the AIPG National website (*www.aipg.org*).

AIPG
303-412-6205
www.aipg.org

AIPG Membership Totals

	As of 10/21/12	As of 11/19/13
CPG / Active	3,446	3,403
CPG / Non-Practicing	371	360
Prof. Member	994	1022
Associate Member	41	48
Young Professional	29	67
Student Adjunct	1,561	2,413
Corporate Member	2	1
TOTALS	6,444	7,314

New Applicants and Members can now be found on the AIPG website at *http://aipg.org/membership/newapps-mems.html.*

Section News can now be found on the AIPG website at *http://aipg.org/sections/sectionnews.html.*

1982: Oregon chapter elections resulted with: President, Allen Agnew (a long-time friend and educator); Vice President, Durga Rimal; Treasurer, Jerry Gray; Secretary, Jeanne Kinney, and the outgoing President was Robert L. Gamer.

1984-85: Early activity was supported by newsletters from other chapters including, but not limited to: Colorado, Ohio, Oklahoma, and Wyoming.

1985: The AIPG magazine, "The Professional Geologist" bore the article, "USGS Postures and Lobbies Capital and EPA". The article addressed the hot environmental issue that not all asbestos minerals were equally dangerous. The Professional Geologist also carried the article, "Professional Self-Regulation Lauded by The White House".

1984-85: A period of discussions and impending legislation in the wings regarding national matters surrounding minerals, metals, and hard assets issues.

1985: Oregon Chapter status-14 members plus 6 retired, with a national membership of 4012.

1984-85: Oregon Chapter President was Allen F. Agnew from OSU, Corvallis, OR. Go Beavers! This was a period of AEG and AIPG enlistment issues. Records show that this may have been the first time that the Oregon Chapter adopted the "SMOG" title. This acronym stood for "Society of Miscellaneous Oregon Geologists." As usual, the bylaws were receiving an overhaul.

1989: We had 23 members, however no messages were found to indicate what mattered most.

1990s- 2011: Business, business, business. John H. Gray stood up to take the reins as Chapter President in 1992.

2012: The Oregon chapter of AIPG continues to use the path of communication with other chapters by directly requesting their newsletters. This has permitted us to see other parts of the country through the eyes of other professionals, and to dream about having that extra time to visit and partake in their local geological field trips, meetings and conventions. This chapter has included the talents of past and present governmental agency personnel, college professors (several of them my own), specialists in mining and economic geology, prolific writers that have educated thousands of the up and coming, and much more. Their lives were and remain today, challenging, hard, productive and rewarding. They are a most impressive collection of talents and experiences that live on forever through each one of us still practicing today. We learned from them and grew to become the best, serving industries, government, and education, while providing a myriad of solutions through science for the greater American and global markets. The market demands growth, new technical products, better transportation systems, and improved construction materials and methodologies, and we have produced them at a frightening pace. Very exciting!

Summary

The past 25 years as a member of AIPG's Oregon chapter and as President, I have shared all of the duties of its operation and particularly enjoyed those random calls from the new national officers. Hearing from other larger chapters through their newsletters is always a treat and serves to remind us that others remain on the forefront of science as well. Students and older practitioners alike are often highlighted in the monthly "*TPG*" issue, which we applaud. t is heart warming to hear that students get to "shadow" politicians and view the government machine in action. To this, we say, "use it, don't lose it" folks as not everyone has those opportunities in their career.

The Oregon Chapter of The American Institute of Professional Geologists salutes the organizers and our predecessors for giving more than just their experience to the organization—you are gold! Feel free to look up the current Oregon Chapter members and to reach out and have discussions. I have always said there is too little time in life for a lot of things needing attention, but the choices here are not those of others, but remain yours for the future.

John H. Gray,
Section President

AIPG Tennessee Section History

The Tennessee Section was formally organized and recognized by AIPG in 1967, four years following the founding of the national organization. The first president was John Jewell with vice-president Berlen C. Moneymaker and secretary-treasurer, Robert J. Floyd. The section membership at that time listed 19 members, eight from middle and west Tennessee and 11 from the eastern part of the state. Of the 744 Charter Members of AIPG, 11 are from Tennessee. These individuals, whose vision brought about the Tennessee Section, include: Robert A. Laurence (CPG-175), William D. Hardeman (CPG-179), John A. Hageman (CPG-264), Stuart W. Maher (CPG-269), Richard G. Stearns (CPG-298), George D. Swingle (CPG-302), Robert J. Floyd (CPG-382), Robert E. Hershey (CPG-416), Edward T. Luther (CPG- 419), Portland P. Fox (CPG-544) and Robert W. Allen (CPG-706).

According to our Dr. Richard Stearns (CPG-298), the Tennessee Section of AIPG was developed in response to the suggestions and urgings of AIPG's first national president Martin Van Couvering to our then state geologist William Hardeman. Mr. Hardeman then rounded up other prominent geologists to develop a section of AIPG whose mission was to pursue professionalism and to safeguard the professional role of geologists in society. It appears that much of the early efforts of AIPG members were directed toward the issue of professional registration. As early as 1957 a rudimentary draft of a geologist registration act was circulating among a few interested geologists in Tennessee. By 1975, AIPG had an official Committee on Registration. The idea of registration and/or licensing generated much debate and it was far from unanimous among geologists that registration by governmental authority was good for the profession. It was not until much later that any success was gained toward a registration act.

During the late 1980's and early 1990's meetings in middle Tennessee were typically held at the University Club on Vanderbilt University's campus and arranged by Vanderbilt's Geology Department Chairman, Dr. Richard Stearns. Other meetings were held in East Tennessee, often at the University of Tennessee Faculty Club. Section officers during this time frame included the following: Robert H. Barnes, Harold R. Beaver, Lawrence I. Benson, Don W. Byerly, Alan T. Dafferner, Sara B. Darrell, Roy K. Garman, Phyllis M. Garman, Kenneth H. Haislip, William T. Hill, Edward T. Luther, Robert A. Miller, Marc J. Norris, Glenn N. Pruitt, Warren R. Rehfeldt, Donald R. Smith, Gregory A. Upham, Lawrence C. Weber, Larry W. Wilbanks and Ronald P. Zurawski.

In 1988, while Robert H. Barnes was president, a motion was made to

host the Annual Meeting of AIPG. The East Tennessee town of Gatlinburg was selected for the meeting to be held in the fall of 1991. Planning for the 1991 National Meeting continued through 1989 and 1990. Don Byerly was president in 1989 and did much of the local networking and planning for the east Tennessee event. Lawrence C. Weber was president in 1990 and became the General Chairman for the meeting. Early arrangements had been made for the meeting headquarters to be the Glennstone Hotel. Because of a change of hotel ownership during late 1990, planning records for the meeting were lost by the new hotel owner, and upon calling for confirmation of the pending meeting, it was discovered that the designated Hotel could not accommodate AIPG. This caused a slight panic which was only alleviated by the fortunate circumstance that The River Terrace Hotel could work with AIPG to provide most of the needed rooms and meeting space. Additional rooms were reserved at other nearby hotels. From the meeting hotel in Gatlinburg, field trips were conducted into the Smoky Mountains and Cades Cove. Guest events included visits to the Biltmore Mansion in Ashville, N C., the Museum of Appalachia in Norris, TN and to entertainment venues in Pigeon Forge, TN. The theme of the meeting was Energy vs. Environment and presentations were given by representatives of the Department of Energy, Oak Ridge National Laboratories, the National Park Service, and by other distinguished geologists and engineers. The 1991 Section President, Ronald Zurawski welcomed members and guests. Attendance was 96 members and 67 guests including speakers. The meeting was a financial success for the section bringing in gross revenues of $21,414 with expenses of $13,354 for a profit of $8,060. From the proceeds, the section made a donation of $1,000 to the AIPG Foundation. Since the annual meeting in 1991, the Tennessee section has held a significant cash balance in its treasury.

Another noteworthy event of 1991 was a revision of the Section's Bylaws, which was suggested by Don Byerly the year before. With this revision, the Section was structured into two sub-sections, a Middle-West Tennessee sub-section and an East Tennessee sub-section. The revision required section officers to be elected alternately from the two sub-sections so that when the president was from the middle-west sub-section the president-elect (or vice-president) would have to be from the east sub-section. This arrangement allowed each sub-section to function somewhat independently and with leadership geared toward successful meetings in the two different geographic areas.

The Tennessee Section of AIPG was instrumental in obtaining legislation for the licensing of professional geologists in Tennessee. Efforts to pursue some form of legal definition or licensing of geologists go back to early days of AIPG, but there was at that time strong opposition in some circles. Geologists themselves were divided in their opinion of the merits of licensing and, for a season, AIPG would promote the CPG as a credential preferred to state licensing. However, in 1988, at the urging of some section members, a bill for the licensure of professional geologists was introduced and was quickly passed and signed into law. The geologist registration act of 1988 was brief and simple, but lacked meaningful language regarding credentials and demonstrations of competence. Subsequent efforts to strengthen the law met with resistance by engineering groups, but these concerns were eventually put to rest through much effort by various members of AIPG and by tweaking the language. Therefore, in 1999, a bill was introduced to amend the registration act to include provisions for examination (ASBOG national exam) and for an advisory board to review applications for licensure. However, the bill was never passed and the 1988 law remained in effect.

After a period of extended apathy, the Tennessee Section learned that the section's treasury had reverted to the national organization of AIPG. As a means of renewing activity and recapturing the considerable funds of the Tennessee Section that were being held at the AIPG headquarters, a rebuilding meeting was held, hosted by Larry Weber, at the offices of Geosciences Design Group, LLC in Nashville. Also, during this period, the 2003 national president, Rick Powers, scheduled a meeting of the national executive committee to be held in Nashville. This event included a meeting with the state section membership, dinner at a catfish restaurant and a visit to a dinosaur exhibit at Opryland Hotel. With the sections treasury restored and a concerted effort to grow the membership, a renewed energy took hold within the section and a group of new leaders emerged. John Hofer and Jerry Archer have provided leadership in the role of president from the east Tennessee sub-section, with Jeb Barrett currently serving as President-Elect. Vanessa Bateman, Sam Vinson, and others have served as the Section president from middle Tennessee, with Todd McFarland currently serving as President.

During the last 10 years, the Tennessee section has tried to strengthen relationships with the East Tennessee Geological Society and through the efforts of John Hofer, the section has participated jointly with the ETGS in meetings and fieldtrips. Also, in recent years, through the work of Vanessa Bateman, a relationship has developed between Tennessee Section of AIPG and the Geosciences Department of Middle Tennessee State University. Several MTSU students attend the section meetings in Nashville. Regular quarterly meetings have typically been held at various venues in the Nashville area. The section also hosted a joint field trip with the Georgia and Alabama sections in 2004 to the Ocoee River Gorge and Ducktown, TN. In 2007 and 2008, the Section hosted a presentation contest during the May Quarterly Meeting where geology students could present their thesis papers and be eligible for cash awards.

The most significant accomplishment since revitalization of the Tennessee Section in 2003 has been the passage of the Geologist Registration Act of 2007. Work on replacement of the old 1988 law began with a survey in 2005 of all professional geologists registered in the State of Tennessee. That survey showed overwhelming support for strengthening the licensing requirements for geologist in the State. The new registration law includes requirements for examinations and a board with provisions available to establish continuing education requirements. The effort was headed by John Hofer and Vanessa Bateman with a host of Section members and non-AIPG geologists providing tremendous assistance. The bill was signed into law by the Governor in June 2007.

On the Geology of Norway – A Synopsis

Robert Font, CPG-03953

My interest concerning the geology of Norway was aroused when my wife and I visited her father's native country to meet her relatives, including various remaining first cousins from the Oslo-Hamar region. Although I never had the pleasure to meet my father-in-law, I have often thought of his adventures at sea, initially as a whaler and commercial fisherman, and eventually as a merchant mariner and captain of his own ship. Undoubtedly, he would have had some fascinating stories to tell.

What I found in Norway is a country of breathtaking beauty, rugged topography and complex geology. In late spring and early summer, it becomes the land of the waterfalls (Figure 1). As one of our planet's geological paradises, I thought I would share some of its wonders with you via this article.

Fig. 1 – Norway's Låtefoss – Photograph by Robert Font.

Norway's general geographic information, natural resources, common geologic hazards, as well as its geomorphology, climate and physiographic regions are summarized in Tables 1 and 2.

A synopsis of Norway's geology is best presented as arranged under three specific headings:

- Continental Norway
- Svalbard Archipelago
- Norway's Petroleum resources

Continental Norway

Continental Norway is part of the Fennoscandinavian Shield. The shield area includes Norway, Sweden, Finland and northwestern Russia (Figure 2). Norway's oldest bedrock is composed of mainly igneous and metamorphic lithic units where absolute dating techniques have yielded values of approximately 3,500 Ma. The country is divided into three basic geologic provinces:

- The Southwestern Gneiss Province.
- The area of the Oslo Rift.
- The Caledonides.

Fig. 2 – Continental Norway and Svalbard (SVA Map.jpg; *numismondo.com*).

The Southwestern Gneiss Province is located in the southern parts of the country, surrounding Oslo and extending into Sweden. The area consists of rocks in the range of 1,700-1,500 Ma, formed during the Gothian Orogeny. The bedrock was subsequently intruded by granitic plutons (1,500-900 Ma). Related hydrothermal solutions resulted in the emplacement of mineral deposits mined in the region located southwest of Oslo. The province is cut in two by the Caledonides. In the south, the gneiss area is wide. To the north, only the islands are still made out of gneiss. This western gneiss was deformed during the Caledonian Orogeny (400 Ma).

Oslo, Norway's capital city (Figure 3), sits on the area of the Oslo Rift. During

Fig. 3 – Oslo's Waterfront, Norway – Photograph by Robert Font.

Permian time (300-250 Ma) the Oslo area broke apart as a rift developed. Magma of Permian age was extruded through volcanism and intruded into the older bedrock. This failed rift (aulacogen) extends into the Skagerrak and the North Sea.

The Scandinavian mountains, or Caledonides, constitute the backbone of continental Norway. The mountains are made up of Proterozoic to Silurian (700-400 Ma) metamorphosed sedimentary and volcanic rocks. These strata were originally deposited in the Iapetus Ocean, the precursor of the present Atlantic Ocean.

The impressive mountains of Norway run through the entire Scandinavian Peninsula (Figure 4). They drop majestically into the North Sea and the Norwegian Sea on the west side, forming the impressive fjords of Norway (Figure 4). To the northeast they curve gradually into Finland and become scarcely more than hills in the vicinity of the Nordkapp (North Cape). The mountains form borders between Norway, Sweden and Finland. Although they are not exceedingly tall, they are certainly very steep and are home to some impressive ice fields and glaciers. The tallest peak is 2,469 meters high (Table 2).

The very old rocks of the Scandinavian Shield (3,500 to 570 Ma) were subjected to crustal deformation and mountain building episodes in the Precambrian. By Early Paleozoic time (540-440 Ma)

Fig. 4 – Mountains at Balestrand along the Songefjord, Norway – Photograph by Robert Font.

the Iapetus Ocean opened between Baltica and Laurentia and some sedimentary rocks were deposited over the rocks of the Shield. The Caledonian Orogeny then followed. This orogenic episode resulted as the Baltic Plate (Scandinavia) collided with the northern part of the continent of Avalonia (New England, Nova Scotia and British Isles area). The ancestral Caledonian Mountains formed across Norway, Scotland, Ireland, Wales and northern England. By Siluro-Devonian time, the rest of Avalonia collided with the continent of Laurentia (North America and Scotland), forming the Appalachian Mountains. This event brought closure to the Iapetus Ocean. By Devonian time, the Old Red Continent had formed, consisting of the old Avalonia, Baltica and Laurentia. This continental mass straddled the equator. In Carboniferous time (355-295 Ma), the landmass containing North America and Europe collided with Gondwana (South America, India, Antarctica and Africa). Mountain building episodes include the Hercynean Orogeny in Europe and the Allegheny Orogeny in the southern Appalachians. By Permian time (290-250 Ma), the super-continent of Pangaea had formed. Northern Europe was relatively stable at this time with the notable exception of the area around Oslo, where continental rifting began with magmatic activity, but failed to develop beyond the initial stage. The resulting aulacogen or failed rift extends into the Skagerrak and North Sea. The intrusions of Larvikite (Norway's national rock) occurred at this stage in the Larvik area of Norway (Table 3 and Figure 5).

Crustal stretching and rifting was prevalent in the Triassic and Early Jurassic. Rifting and basaltic volcanism occurred in the Middle Jurassic. Warping of the Earth's mantle created the North Sea Dome in the area

Fig. 5 – Larvikite, Norway's National Rock – Photograph by Robert Font.

which now covers the Viking Graben, Central Graben and Moray Firth Basin. Sea level rose in the region of the North Sea Graben Province (NSGP). Upper Jurassic organic-rich shales were deposited under anoxic conditions. A subsequent sea-level fall gave rise to the development of reservoir-quality rocks, mainly in the form of coarse-grained clastics, while chalk deposition became prevalent in the Cretaceous. These strata were later blanketed by fine-grained Tertiary sediments. In Cretaceous to Oligocene time, collision between Africa and Europe triggered the Alpine Orogeny which, in turn, controlled the subsidence of the North Sea Basin. Post-Alpine rifting followed, along with the opening of the Mediterranean Sea.

Portions of Scandinavia were covered and depressed by as much as four kilometers of ice in recent glacial episodes. When the ice disappeared and with the weight removed, much of the area rose in response to isostatic rebound. The rising continues today at a rate of one meter per century. At one time, the sea reached what is a current elevation of 221 meters in Oslo, 180 meters in Trondheim and 25 meters in Stavanger. In contrast, the southernmost part of Scandinavia has tended to sink down to compensate for the rising of the northern areas. The result has been flooding in Denmark and the Low Countries of Northern Europe.

Continental Norway was covered by large ice sheets during the Pleistocene Epoch (~2 Ma to 10,500 years ago). During warmer periods, rivers carved intermontane valleys, while glaciers deepened and widened them under cold spells. As the ice sheets eventually melted, glacial valleys were drowned by the rising seas, giving rise to the now-famous fjords. During the ice ages, nunataks were common sites throughout the region. It is important to point out that present-day glaciers (Figure 6) are not the remnants of the old ice sheet, as they are the result of a more recent

Fig. 6 –The author in Norway's glacier region – Photograph by Hilma Font.

Fig. 7 – Rock slide, Norway – Photograph by Robert Font.

event. It is documented that 9,000-5,000 years ago, the climate was warmer and melted the last ice sheet.

As pointed out on Table 1, avalanches and landslides are common geological hazards affecting Norway (Figure 7).

Svalbard

Svalbard constitutes an archipelago belonging to Norway located in the Arctic Ocean, midway between the Scandinavian Peninsula and the North Pole (Fig. 2). Svalbard comprises all islands between latitudes 74 to 81 degrees north and longitudes 10 and 35 degrees east. There are seven principal islands with Spitsbergen being one of the key areas. The region is characterized by rugged mountains with steep flanks, as well as fjords. The highest peak in NE Spitsbergen is 1,717 meters above sea level.

The geology of Spitsbergen records a fascinating history of continental drift and structural deformation. At the dawn of the Paleozoic Era, Svalbard was located near the South Pole. Cambrian and Ordovician rocks are represented by calcareous limestone indicative of marine conditions. Fossil specimens from these rocks include trilobites and graptolites. Plate collisions in the Silurian gave rise

to the Caledonian Orogeny and resulting rock deformation is reflected by local folding, faulting and intrusions of granite. By Devonian time the Svalbard area was located at the equator, mountains were undergoing erosion and the land had begun to sink. Conglomerate, sandstone and shale were deposited near the shoreline, along deltas and lakes. The red sandstone deposited at this time is indicative of dry and desert-like conditions. By Carboniferous time, the area had drifted northeastward into a more tropical climatic zone where swamp conditions are reflected by coal bed deposits. During mid to late Carboniferous time, seas moved in and out generating alternating deposits of terrestrial and marine sediments. Standing bodies of water evaporated giving rise to the deposition of gypsum and anhydrite, as well as dolomite. Fossil mollusks and snails are found in these strata. In the Permian, subtropical shallow seas covered the area. Periodic dry periods gave rise to new deposition of gypsum, anhydrite and dolomite. Fossil shells, siliceous sponges and bryozoans are found in these rocks. The latitude at this time was about 45 degrees N.

During the Mesozoic Era, a greenhouse world developed, with temperatures much higher than at present. Marine and land-derived sedimentary rocks were deposited and volcanic flows occurred. Fossils of this age include bivalve mollusks, ammonites and reptilian remains. Shallow seas dominated the Jurassic and Early Cretaceous time frame. Clay-rich marine shale deposits contain fossil ammonites, belemnites and bivalve shells. Fossils of the aquatic dinosaurs - plesiosaur and ichthyosaur - have been found locally. By mid to late Cretaceous time, alluvial plains were sites of deposition of abundant river sand containing plant remains. Fossil footprints of the herbivorous Iguanodon and the carnivorous Allosaurus have also been found. Mild climate with dense vegetation was typical of this time, and the region was located at about 50 to 60 degrees N latitude. The Cretaceous continued with alternating land and marine deposits in shallow seas and deltas, and closed with tectonic uplift and erosion.

In the Tertiary strata, there is evidence of plate collision with Greenland. Folded mountains developed along the western front of Svalbard. Deposition occurred in the basins to the east, where alluvial sediments and coal beds are found. Intense faulting and volcanism followed, with widespread lava flows. The climate cooled significantly due to the northward tectonic plate drift and the establishment of a period of global cooling. Repeated glaciations occurred starting at around 3 Ma, with the creation of fjords, bays, valleys, cirques, horns and arêtes that we see today. The last glacial cycle occurred from about 115,000 to 10,000 years before present and consisted of two to three major glacial periods followed by interglacial periods of glacier melting and retreat.

Three volcanoes are worth mentioning in relation to Norway. In Svalbard, an extinct volcano, Sverrefjellet, rises to a height of 507 meters above sea level. The only active volcano in Norway's North Atlantic territory is Beerenberg, a 2,277 meter stratovolcano which forms the northeastern end of the Norwegian island of Jan Mayen located between continental Norway and Greenland. Beerenberg constitutes the world's northernmost subaerial active volcano. Finally, Bouvet Island is an uninhabited sub-Antarctic volcanic island and dependency of Norway located in the South Atlantic Ocean. It lies at the southern end of the Mid-Atlantic Ridge and is certainly one of the most remote islands in the world.

Norway's Petroleum Resources

The breakup of Pangaea, the formation of the North Sea Dome, the extensional rifting of the North Sea Graben Province (NSGP), the opening of the Atlantic Ocean and the development of the Atlantic passive margin established the proper set of conditions that led to the generation and accumulation of a substantial portion of the petroleum resources found in northern Europe. Near Scandinavia, proven and potential petroleum regions include the Viking Graben, Central Graben, Moray Firth Basin and the Vestford-Helgeland Province (along the Atlantic margin of western Norway). The Vestford-Helgeland zone includes the areas of the Halten Terrace, Trondelag Platform and the Shelf-Continental Margin of mid-Norway. For all of these regions, the main source rock is the Upper Jurassic (Malm, Kimmeridgian) complex of anoxic black shales. In the Vestford-Helgeland Province, these source rocks are known as the Spekk Formation. Norway's petroleum resource statistics are summarized on Table 4.

Reservoir rocks in the North Sea area include coarse-grained clastics of Triassic, Middle Jurassic and Upper Jurassic age (Brent Group). Sandstones associated with littoral, barrier-bar, deltaic and submarine-fan complexes constitute excellent reservoirs throughout. Cretaceous and Paleogene-age chalk, submarine-fan and channel sandstones also provide additional targets of reservoir-quality strata. Specific reservoirs in the area are depicted on Table 5.

Structural traps in the area are predominantly fault-block closures and fault traps. Stratigraphic traps occur within the submarine-fan, channel and bar sandstone complexes. Seals are provided by the overlying and blanketing fine-grained clastics of Tertiary age and by locally-developed permeability barriers.

Source rocks range in age from late Jurassic to Early Cretaceous (Oxfordian to Berriasian) and include the Late Jurassic (Malm, Kimmeridgian) anoxic shales. Shales of excellent source-rock quality occur in the Heather Group and overlying Kimmeridge Clay/Mandal Formation/Draupne Formation throughout the North Sea province. These strata may attain thicknesses of 3,000 meters. Organic richness and maturation attributes of these source rocks are shown in Table 6.

In addition to conventional oil and gas, Norway has enormous potential when it comes to unconventional hydrocarbon resources. These include shale gas, shale oil and deposits of methane hydrates.

Conclusions

In summary, Norway's geology is most interesting as well as challenging. We found the people to be warm and friendly and the cities and villages picturesque and culturally fascinating. In Oslo alone, attractions such as Frogner Park, Akershus Fortress, the Viking Museum, the Open Air Museum and countless other attractions are certainly worth the visit!

Skål!

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General Information	Approximate Lat/Long and Area	Borders	Natural Resources	Land Use and Natural Hazards
Part of Scandinavia About 2/3 mountains Some 50,000 islands off an indented coastline One of the most rugged and longest coastlines in the world	Lat/Long 62°00' N 10°00' E Areas: 323,802 sq km (total); 307,442 sq km (land); 16,360 sq km (water)	Borders: N. Atlantic Coastline: 25,148 km Finland: 727 km Sweden: 1,619 km Russia: 196 km	Resources: Petroleum & natural gas Metals: Iron ore, copper, lead, zinc, titanium, nickel Others: fisheries, timber, hydro power	Arable land: 2.7% Other: 97.3% (2005) Irrigated land: 1,270 sq km (2003) Hazards: Rock slides, avalanches, etc

Table 1 – Norway's General Geographic Information.

Geomorphology and Climate	Physiographic Regions
Terrain: a) Glaciated b) Mostly high plateaus & rugged mountains broken by fertile valleys; c) Small, scattered plains d) Coastline deeply indented by fjords; e) Arctic tundra in the north f) Maximum elevation: 2,469 meters g) Territorial seas: 20 nautical miles h) Continental shelf: 200 nautical miles Climate: a) Temperate along coast b) Colder interior with more precipitation and colder summers c) Year-round, rainy western coast	Continental Norway: a) Scandinavian mountains b) Sothern Skagerrak coast c) Southeast Norway d) Western fjords e) Trondheim area f) Far NE Norway Norway's Territories: a) Svalbard b) Jan Mayen Island c) Bouvet Island d) Peter I Island e) Queen Maud Land

Table 2 – Norway's Terrain and Physiographic Regions.

Location	Location and Genesis	Petrology Classification and Usage	Mineralogy
Found at Larvik, about 80-90 kilometers SW of Oslo. With an area of about 1,000 sq km, quarries include Grinda and Hedrum, 2 km from Larvik Town and Tjølling, 8 km north of Larvik Harbor	Larvikite began cooling under lower crustal conditions, but the chemistry of the magma changed at the lower temperatures at shallower depths The rock results from Permian-age magma emplaced during the opening of the Oslo Rift (aulacogen) during the breakup of Pangaea	Larvikite is a plutonic igneous rock with phaneritic texture, classified as an alkali syenite (Huang, 1962) or quartz-poor monzonite (mindat.org, 2013) The rock is a common and popular ornamental stone	Composed of ternary feldspar containing all three end-members The feldspar is perthitic, with alternating alkali and plagioclase feldspar layers resulting in the "Schiller Effect" and blue shiny crystals of $(Na,K)AlSiO_3$ or anorthoclase Accessory minerals: ferromagnesians, nepheline, magnetite and apatite

Table 3 – Larvikite, Norway's National Rock.

Norway's Discovered and Undiscovered Reserves	Norway's Proven Resources	North Sea Graben Province (NSGP)	Halten Terrace and Trondelag Platform	Mid Norway Shelf and Continental Margin
Estimate (2013): ~85 BBOE	Proven reserves: ~5.32 7.0 BBO + 79 TCFG	Undiscovered, conventional O&G: ~ 4-25 BBO + 11-75 TCFG	Undiscovered, conventional O&G: ~ 1-13 BBO + 8-82 TCFG	Undiscovered, conventional O&G: ~ 31-786 BBO + 1-269 TCFG

Table 4 - Norway's Petroleum Resource Statistics.

Devonian	Old Red Sandstone sediments (oil-prone throughout the NSGP)
Carboniferous	Limestones, Coal Measures and rocks of the Lower Rotliegend Group (gas-prone throughout the southern portions of the NSGP)
Permian	Upper Rotliegend Group and Zechstein Group (oil-prone and gas-prone strata throughout the central and southern portions of the NSGP)
Triassic	Cormorant Formation and Hegre Group (oil-prone rocks in the northern NSGP) and Skagerrak Formation (central NSGP). Bacton Group (gas-prone sediments in the southern NSGP)
Jurassic	Brent Group (northern NSGP), Heather Group (northern NSGP) and Humber Group (central and southern NSGP); oil-prone and gas-prone strata throughout
Cretaceous	Cromer Knoll Group, Shetland Group and Chalk Group (oil-prone and gas-prone rocks)
Tertiary	Paleogene porous clastic sediments (oil-prone and gas-prone throughout the NSGP)

Table 5 – Norway's Petroleum Reservoirs (after Brennand and others, 1998).

TOC Values (Range)	TOC Values (Avg)	Maturation Status	Predominant Kerogen Type	Timing of Maturation & Migration
2% - 15%	5%	Mature to Overmature	Type II with Types I and III locally important	Starting in Late Cretaceous & continuing to present-day

Table 6 – Norway's Source Rock Attributes.

AIPG South Dakota Section History

One thing about having a relatively small to medium-sized Section (~55 members); even in a geographically large state like South Dakota, you get to know one another! The South Dakota Section <*http://sdspacegrant.sdsmt.edu/sdaipg.htm*> has been in existence for 18 years, but we have a 39-year history.

Eleven years after the founding of AIPG in 1963, 15 CPG's (12 residing in North Dakota and three in South Dakota) petitioned AIPG Headquarters to form the "Dakota" Section. The three petitioners from South Dakota were John Paul Gries, John C. Mickelson, and Jack Kume. As a result of that petition, the Dakota Section and its Bylaws were formally established in 1974 consisting of members from both states. The Dakota Section existed for 21 years until 1995 when the South Dakota Section was formally established and the two states became separate Sections. The South Dakota Section developed proposed Bylaws in 1995, but they weren't formally approved until 2010 after Section President John Foster Sawyer took the initiative to complete the process.

Gary H. Haag served as the first President of the South Dakota Section, as well as Chairman of the Regulatory and Legislative Committee. Gary faithfully led the Section for many of its early years along with Vice President Timothy Vogt, Secretary-Treasurer Steve Jorgensen, and Screening Board and Membership Chairman Tom Durkin. The current President is Tom Durkin, serving his third non-consecutive term in that position. Other CPG's who have served as Presidents include Perry Rahn, John Foster Sawyer, and Larry Stetler. John Foster Sawyer currently serves as AIPG National Secretary.

The members of the Section were honored this past year to have hosted AIPG's 49th annual meeting in Rapid City, SD in September 2012; the first time the national meeting had ever been held in South Dakota!

The South Dakota Section holds its annual meeting in March, in conjunction with the SD Department of Environment and Natural Resources' (DENR) annual Environmental and Ground Water Quality Conference in Ft. Pierre, SD. In fact, the Section's first organizational meeting was held during the DENR conference in 1995. The annual DENR meeting always attracts a large number of local environmental professionals, several of whom are AIPG members. Holding the Section meeting at the DENR conference provides consistency and assures a good turnout of AIPG members along with geologists considering membership. The Section has been growing in recent years and currently stands at about 55 members.

Nine years ago, the SD Section established the J. P. Gries Geologist of the Year Award in honor of longtime geology professor John Paul Gries of the SD School of Mines & Technology. The award is provided annually by the Section to a South Dakota geologist in recognition of exceptional work and service to the profession of geology at large, or in some recognized specialty within geology.

The SD Section holds an annual field trip during the summer for members and their families. This is always a fun event where we visit a geologically interesting area, learn about it, collect rocks, raffle an item of geologic significance, and, of course, eat (photos can be seen on the AIPG webiste at *http://aipg.org/sections/sectionhistories.html*

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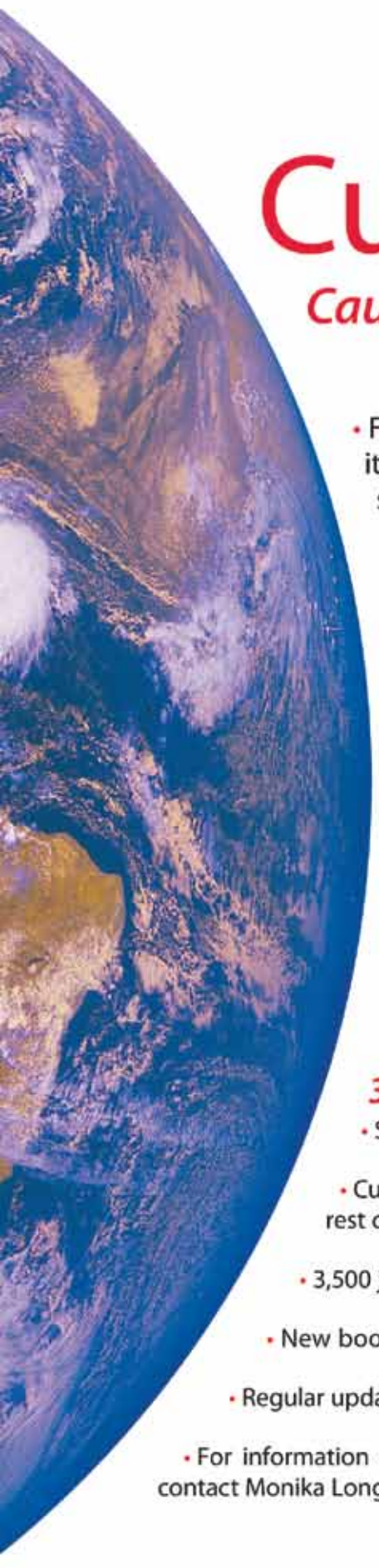

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