

SEISMIC HAZARD ASSESSMENT IN NEW YORK STATE

Presented by

DONALD H. CADWELL

New York State Geological Survey
Albany, New York

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In May 1990, the New York State Disaster Preparedness Commission initiated a multi-year earthquake preparedness project for critical services and infrastructure (Lifelines). This project is being funded by the Federal Emergency Management Agency (FEMA), with New York State providing an in-kind services match to federal dollars. The main emphasis of the New York State Emergency Management Lifelines Program is to develop the ability to conduct earthquake loss estimates for scenario events. Specifically, they need to determine expected damages, casualties, shelter needs, and such secondary effects as fire and toxic releases, and then utilize this information for mitigation and response planning.

A major task of this project is the design, development, and implementation of a Geographic Information System (GIS) capable of facilitating vulnerability analysis, mitigation strategy, and response planning efforts. An integral part of this system is the development of GIS data sets that characterize the response of the State's soils, bedrocks, and stratigraphy to seismic disturbances. The preparation of earthquake hazard maps is based on these data sets.

The New York State Geological Survey (NYSGS) has begun a systematic Seismic Hazard Assessment Program with analyses for Columbia and Dutchess counties (1994, 1995), portions of Rensselaer, Green, and St. Lawrence counties (1996). The purpose of this county work is to develop a system for state-wide correlation for the Seismic Hazard Assessment of New York State. Onondaga County was selected for study in 1997 because of the types of surficial materials deposited within the County during retreat of the Wisconsin Ice Sheet, 13,000 - 10,000 years ago, and because of the large urban population in the greater Syracuse region. Lacustrine sands, silts, and clays were deposited in Glacial Lake Oneida, a 1,036 square-kilometer lake that developed at the edge of the glacier front, during the waning stages of Woodfordian deglaciation. Glacial Lake Oneida included most of the lowland and swamp regions within 15 - 30 kilometers of the present 650 square-kilometer Oneida Lake. Major earthquake damage occurs from attenuation of shear-waves as they travel from bedrock into the surficial glacial sediments. As the shear-wave velocity decreases in the unconsolidated sediments (together with a shortened wavelength), there is a corresponding increase in wave amplitude. The increased amplitude produces greater ground shaking and, consequently, increased damage.

Don't forget! We will convene on Thursday, September 10, at the Glen Loch Restaurant. The evening will conclude with an open question and discussion period with Mr. Cadwell. See you then!

PRESIDENT'S PAGE

By Vita DeMarchi

CNYAPG 1998/1999 SEASON OVERVIEW

“Geology - The Next Generation” was phrased as this season’s general theme. CNYAPG will provide a forum for students to participate and become acquainted with the geologic profession and meet geologist researching and applying various disciplines. We hope to encourage and inspire students and remind others of the *excitement of science*. Consider your participation a professional tithing to the next generation. This year’s agenda will include the following student-oriented endeavors:

⇒ *Student Articles and Abstracts* will be featured in the newsletter. Local college geology departments (*you know who you are likely to be*) will be contacted to encourage students to participate in CNYAPG by providing a short article, abstract, or commentary on any geology and related science subject. If you have the opportunity, encourage one student to participate. Each participating student will be a guest at our monthly meeting and will receive a subscription to this year’s newsletter.

⇒ *February 1999 Student Poster Session* will provide college students the opportunity to present a poster and abstract at the monthly meeting. Participating students will benefit from discussion and interaction with professionals.

⇒ *High School Science Fairs:* CNYAPG members who are high school teachers are urged to assist in making the best use of the newsletter networking to bring geologists to your classroom or to assist with science fairs. We encourage geologists who are contributing professionally as science teachers to provide input during this season.

⇒ *MOST Science Fair Sponsor:* For the third year, CNYAPG will participate as sponsor and special judges. This science fair includes elementary and high school students from all over Onondaga County. Two students will receive a “rock” mounted commemorative award, a \$50 Savings Bond, and will be featured in the newsletter.

*As Always....*CNYAPG board members strive to provide interesting monthly speakers and topics that address applied and academic disciplines of geology. Input and leads on speakers are always welcome.

*Field Trips...*It has been a CNYAPG tradition to gather for a local field trip. Any ideas or interests on where to spend a day this coming Fall (or Spring)?

*Seminar...*We will again be looking to coordinate a short-course or seminar in the late Spring of 1999.

Please contact volunteer Board members with your input and ideas. On behalf of the Board members, we look forward to this season’s participation and agenda.

GEOLOGIC NEWS OF INTEREST

Compiled by
Vita DeMarchi

Natural Attenuation Short Course: A Productive Season Ending

The **CNYAPG** and **NYSCPG** sponsored **Natural Attenuation Short Course** was a strong ending to last season's agenda. The one-day seminar featured **Dr. R. Ryan Dupont** of Utah State University and the Utah Water Research Laboratory. **Don Ochs** from **Regenesis Corporation** provided an overview of applying oxygen release compound (ORC) to enhance aerobic bioremediation.

Dr. Dupont stressed the fact that natural attenuation is not an "*innovative technology*." It is most applicable to low-risk sites with low-level groundwater impacts, sites where achieving compliance in a short time frame is not a driving issue, and in cases where other alternatives are impracticable. Natural attenuation could be combined with other, more aggressive alternatives that remove or reduce contaminant mass to address remaining dissolved phase groundwater impacts.

Demonstrating natural attenuation (or assimilative capacity) at a site requires a rigorous site assessment, quantitative analysis of data, a detailed conceptual site model, and a commitment to conducting long-term monitoring. Although the appeal is there to promote this "low tech" approach, it may not be the most cost effective alternative in the long run. Determining the projected assimilation time of the contaminant mass is key in evaluating selection of this remedial alternative.

Methods to evaluate data for natural attenuation evidence and conduct qualitative analyses of data were overviewed. Dr. Dupont reviewed available support models. The Bioscreen model (available free and set up on Excel) and his own developed model, *Natural Attenuation Decision Support System (NADSS)*, were identified as straightforward models. He felt that, although MODFLOW could be applied, that level of complexity was generally not necessary to make the evaluations and decision regarding natural attenuation potential and status.

CNYAPG has a Web Page link to Dr. Dupont's NADSS Home Page. Regenesis provided attendees with a disk copy of ORC Application Software (Excel).

Members of the NYS Department of Environmental Conservation (NYSDEC) Spill Response Division from different regions attended the short course. UST Programs throughout the country are leaders in driving natural attenuation/ intrinsic remediation

as a viable alternative. Reported spill sites associated with NYS USTs implementing source removal and enhanced natural attenuation using ORC have been granted "no further action" by the NYSDEC.

Thanks to Sarah McCulloch and David Palmerton for volunteering their time to organize the Short Course.

NYS Council of Professional Geologist Licensure Bill Update

The bill was established in both legislature houses in 1998 and has gained the support of the Eastern Society of Land Surveyors. Support has been expressed by the local chapter of the American Society of Civil Engineers and Consulting Engineers Council of NYS, although a limited number of concerns were voiced. An official memorandum of opposition was distributed by the NYS Society of Professional Engineers on the occasion of *Engineers Lobby Day*; however, their objections are narrowed to three points focused on the types of services that geologists and engineers will be able to perform under the licensure program. Opposition by soil scientists is based on their position that the bill should be revised to include soil scientists as geologists under the general term, "Geoscientist."

No further action on the bill will occur until next session beginning in January 1999. For more information, contact the NYSCPG at P.O. Box 255, Dewitt NY, 13214 or link up through your CNYAPG Web Page.

Do Earthquakes Occur in New York State?

An Interpretation of
Commentary by Isachson,
Y.W., E. Landing, J.M. Lauber,
et al., eds., and
Adapted from *Earthquake! What,
Where, When, Why* (Chapter 17);
Geology of New York: A
Simplified Account, Albany: New
York State Museum/Geological
Survey, 1991, pages 231-238, and
[http://nceer.eng.buffalo.edu/faqs/
eqlist.html](http://nceer.eng.buffalo.edu/faqs/eqlist.html)

According to **plate tectonic theory**, we would expect to find most earthquakes along divergent margins (where plates separate), along transform margins (where plates grind sideways past each other), and along convergent margins (where two plates collide). Over 95 percent of earthquakes occur in these three kinds of areas. New York State is far from any plate margins. Nonetheless, between 1730 and 1986, more than 400 earthquakes for which location could be determined occurred in New York State, with a magnitude greater than 2.0. New York State has had the third highest earthquake activity of states east of the Mississippi River.

The historical record concludes that earthquakes have recurred in the same areas of New York since 1730. The largest known New York State earthquake happened in the Cornwall-Massena area along the US - Canadian border on September 5, 1944. It had a maximum intensity of VIII on the Modified Mercalli scale (Richter

magnitude about 6). It was strong enough to damage even well-constructed buildings. It knocked down chimneys and walls and overturned heavy furniture.

Seismic Vulnerability of New York State: Code Implications for Buildings, Bridges, and Municipal Facilities

An Interpretation of
Commentary by Klaus Jacob
and
Adapted from a Reprint from
NCEER Bulletin, Volume 7,
Number 2, April 1993, pages 4-5,
and
[http://nceer.eng.buffalo.edu/faqs/
jacob.html](http://nceer.eng.buffalo.edu/faqs/jacob.html)

In response to the earthquake risk to New York State, a variety of seismic hazard reduction measures are proposed. Seismic Building Codes have been drafted for both New York State and New York City. Both are quite similar and represent essentially partially modified versions of the Uniform Building Code (UBC). New York State is divided into four seismic zones: A, B, C, D, with seismic zone factors of $Z = 0.09, 0.12, 0.15,$ and 0.18 , respectively (measuring effective peak acceleration in fractions of g , where g equals the earth's gravity acceleration). Five seismic soil-type factors, $S_0 = 2/3, S_1 = 1.0, S_2 = 1.2, S_3 = 1.5,$ and $S_4 = 2.5,$

respectively, ranging from very hard rocks (S_0) to very soft soils (S_4). A soil liquefaction screening procedure is also included in the code.

The New York State Department of Transportation (NYSDOT) has issued an internal Engineering Instruction requiring all new highway bridges in New York State to be designed for seismic forces assuming a state-wide seismic zone factor of $Z = 0.19$. On October 9, 1991, the Federal EPA issued Revised Minimum Federal Criteria for Municipal Solid Waste Landfills (MSWLFs). Notably, among other site limitations, there are at least three geologic/earthquake-related guidelines included.

The introduction of these seismic provisions into land use planning, engineering, design, and construction practice will need the joint attention of the practicing engineer, geotechnical, and seismological community, and of regulatory bodies and decision makers, especially where site-specific studies are needed or may lead to more economic solutions.

Onondaga County lies within Seismic Zone B, considered to be a lower seismic hazard zone. The majority of New York State is characterized as a moderate level (Zones C and D) seismic hazard. A look at the New York State Seismic Zoning Map and other New York State earthquake information can be obtained at:

[http://nceer.eng.buffalo.edu/
faqs/jacob.html](http://nceer.eng.buffalo.edu/faqs/jacob.html)

September 10, 1998

CNYAPG @ Glen Loch Restaurant . A cash bar will open at 5:30 p.m. followed by dinner at 6:30. The presentation will begin at 7:30. Dinner is \$13 (if reserved 24 hours in advance) or \$15 at the door.

Make your reservations today by calling O'Brien & Gere Engineers at (315) 437-6100 ext. 2656. See you there!

September 11-13, 1998

27th Annual Conference on the Environment, sponsored by the *NYS Associations of Environmental Management Councils and Conservation Commissions*. Keynote speaker David Pimentel, Professor of Ecology and Agricultural Science at Cornell University, who will address the value of natural systems to society. For more information, contact Conference Coordinator Sandy Stein at (607) 274-5560 or by e-mail at sgs@cornell.edu.

October 5-6, 1998

Annual Fall Recycling and Vendor Exhibition, held by the *Federation of New York Solid Waste Associations*, at the Four Points Hotel in Liverpool, New York. The event is sponsored by the NYSDEC, Empire State Development, Cornell Waste Management Institute, and the Buy Recycled Alliance of New York (BRANY). For information, contact Eric Swenson at (516) 677-5790, or fax (516) 677-5875.

* THIS MONTH'S *
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Vita DeMarchi * Gerry Gould
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The Board Members would like to thank all of the corporate and individual supporters of CNYAPG throughout the past year. We would like to encourage you to continue your pledge of support throughout the upcoming year. Contact Steve Crook at (315) 437-1429 or (518) 827-5720 details.

AUGUST 1998

CNYAPG NEWSLETTER - AUGUST 1998

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AUGUST 1998

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Presented by

DONALD H. CADWELL

New York State Geological Survey
Albany, New York

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We will convene on Thursday, October 8, at the Glen Loch Restaurant. The evening will conclude with an open question and discussion period with Mr. Cadwell. See you then (unless there is an earthquake!).

In May 1990, the New York State Disaster Preparedness Commission initiated a multi-year earthquake preparedness project for critical services and infrastructure (Lifelines). The main emphasis of the New York State Emergency Management Lifelines Program is to develop the ability to conduct earthquake loss estimates for scenario events. Specifically, they need to determine expected damages, casualties, shelter needs, and such secondary effects as fire and toxic releases, and then utilize this information for mitigation and response planning.

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Labor Day Storm Took Wind Out of September's Dinner Meeting

In making the decision to cancel last month's opening dinner meeting due to the Labor Day storm, I resisted the temptation to say, "As geologists, we should be able and prepared to go and do what we need to in any type of weather occurrence." I had the sense of determination I feel when mastering a long hike (back down) or going the limit to obtain just the right sample. My geologist and scientist friends shared the same feeling. Luckily, most of us on the Board were smart enough to consider all of the data, including the fact that the Glen Loch, although able to feed us, were not sure the generators could power our projector. It is my understanding that Dr. Cadwell would have given the presentation around a circle of flashlights. In fact, he did give a version of the presentation to an S.U. contingency. The rest of us will not have to miss out. Dr. Cadwell has agreed to give his presentation at the CNYAPG September Dinner Meeting. Our apology to the "real" geologists who made their

way to the Glen
Loch (and I do
know there was
at least one.)

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BEYOND EARTH SCIENCE NEWS

Compiled by
Jon S. Fox &
Vita DeMarchi

Geologic News from Mars

The Global Surveyor mission was launched in November 1996, with the primary missions of mapping the topography and magnetic fields of Mars. The July 1998 Newsletter from the International Association of Geochemistry and Cosmochemistry indicates that Global Surveyor has produced preliminary evidence of localized, intense magnetic anomalies formed in Mars' crust. These data apparently suggest that Mars possessed a global magnetic field in its geologic past.

Additionally, chemical analyses of Martian igneous (volcanic) rocks near the Pathfinder landing site show significant variation in composition. There is an ongoing debate regarding whether the observed variations are representative of the actual rock chemistry or whether the results are affected by dust coatings on the rocks.

Metallic Hydrogen?

An article published in the latest version of *Chemical and Engineering News* (August 24, 1998) indicates two

independent groups of researchers have successfully converted deuterium (a heavy isotope of hydrogen) under high pressure and temperature into a metallic phase. The transition was observed based on data regarding reflectivity and compressibility. The results apparently are applicable to normal hydrogen. These data suggest many giant planets (i.e., Jupiter, Saturn) may have a core composition consisting mostly of metallic hydrogen.

For more information on Mars, look into the many Web sites, including one very informative page that includes a focus on the chemistry and geology of Mars: <http://ntserv.fys.ku.dk/mars.html>

Mystery of Jupiter's Rings Solved by Cornell Scientists

Just 20 years after the rings of Jupiter were discovered by the spacecraft Voyager, Cornell University scientists proclaim they have solved the mystery of the rings. The images taken from the spacecraft Galileo showed four rings around Jupiter. The images of the rings best be seen when sunlight falls on them and reflects off the dust particles. Galileo had to be positioned in Jupiter's shadow, looking back at the planet. The Cornell scientist say the faint rings are made of dust kicked up when cosmic debris smashed into the planet's four moons. Each of those collisions causes a little explosion resulting in a slender tube of debris formed around the moon's orbit. Evidence supporting the theory is the match between the thickness and tilt of the rings and the moon's orbit. Questions still remain about what the rings and the moon material is made of. The new images and information on the Galileo mission is available at

www.jpl.nasa.gov/galileo and at www.news.cornell.edu/releases/sept98/jupiter_rings.html.

And Now, a Little Closer to Home...

Moon Water (or Is It "moon-water")

Lunar Prospector spacecraft identified the presence of up to 10 billion tons of frozen water near both lunar poles. Alan Binder, chief scientist of the Lunar Research Institute in California adds his vision for use of lunar water, indicating that there is enough water to build a moon colony and operate a rocket service station for journey's into deep space. The frozen water is considered a "enabling resource". In addition to sustaining life, water can be used for rocket fuel by breaking it into hydrogen and oxygen. Where there are resources to enable, there will eventually be residuals to manage. Hydrogeologist will prepare for exciting new challenges, and no doubt high-end modeling.

Meanwhile, Back on Earth

Central Asia's dying Aral Sea may disappear by 2015. The roots of the region's worst ecological disaster lies in the 1960s when the Soviet leadership decided to boost cotton output by drawing vast amounts of water from the mighty Syr Darya and Amu Darya rivers to irrigate crops, which feed the Aral.

Forty years ago, about 60 cubic km of water flowed into the sea every year. Now, only 1 to 5 cubic km trickles through annually, depending on rainfall.

Ship hulls and piles of anchor

chains lie rusting in a sea of sand shifting in the wind in what used to be busy fishing towns in Uzbekistan. Cotton accounts for more than a third of export revenues. Uzbek officials are reluctant to let more water flow into the dying sea and locals view the problem as “ ‘White gold’ has drunk the sea.”

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October 2-4, 1998

NYS Geological Association Annual Meeting, SUNY at Binghamton, NY. Contact H.R. Nasland at (607) 777-4313, or visit the Web site: <http://www.Geol.Binghamton.edu/NYSGA.html>.

October 5-6, 1998

Annual Fall Recycling and Vendor Exhibition, held by the *Federation of New York Solid Waste Associations*, at the Four Points Hotel in Liverpool, New York. For information, contact Eric Swenson at (516) 677-5790, or fax (516) 677-5875.

October 11-17, 1998
Earth Science Week

Western New York Earth Science Week Celebration, professional geological organizations, educational institutions, and related businesses will be celebrating Earth Science Week at the Penn Dixie Paleontological and Outdoor Education Center in Hamburg, NY. Groups will be available to discuss earth science careers, explain geologic activities, two local dinosaur hunters will show bones they have recently collected, a display of geological equipment used during field investigations, and more. This event is combined with the Hamburg Natural History Society's October Public Day program to collect fossils at the Penn Dixie site. The only charge is for non-HNHS members who want to collect fossils: \$3 for adults, \$2 for children. All other on-site activities are free. 9 AM to 3 PM; for further information, contact Rick Watt or Jerry Bastedo at (716) 684-8060 or the HNHS at (716) 627-4560.

October 16, 1998

Deadline: The Abacus and Rose Poetry Contest, sponsored by the Museum of Science & Technology. Open to adults, teens, and children. Submit two typed or legibly printed copies of poems (keep your original) about science, nature, and/or ecology with your name, address, phone number, and age category on the **back** of your poetry entry. Winners will read at the annual *Abacus & Rose Poetry Reading* on November 15th. Mail entries to: THE MOST, Franklin at W. Jefferson St., Syracuse, NY 13202.

October 21, 1998

HMPGA Dinner Meeting, 6 PM at the Best Western, 200 Wolf Road, Albany, NY. Guest speaker: Dennis Suszowski, Hudson Research Group, "Dredging in New York Harbor."

October 8, 1998

CNYAPG @ Glen Loch Restaurant . Donald H. Cadwell of the New York State Geological Survey will be our guest speaker. A cash bar will open at 5:30 p.m. followed by dinner at 6:30. The presentation will begin at 7:30. Dinner is \$13 (if reserved 24 hours in advance) or \$15 at the door. Make your reservations today by calling O'Brien & Gere Engineers at (315) 437-6100 ext. 2656. See you there!

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SEPTEMBER 1998

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CNYAPG e-mail directory needs updating. Our e-mail directory fell short in reaching many members regarding the September cancellation (assuming you had phone service). We sent an e-mail message to CNYAPG members announcing the cancellation and received many undeliverable messages due to outdated addresses. The CNYAPG e-mail list allows us to provide last minute notices about meetings and advanced notice of special events, speakers, and news. If you would like to be included on the CNYAPG e-mail list, please send an e-mail message to CNYAPG secretary, Gerry Gould, at ggould@dreamscape.com or visit our web site at www.dreamscape.com/cnyapg and leave a message. The storm provided us both destruction and opportunity.

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarch@secor.com.

SEPTEMBER 1998

APPLICATIONS OF GEOPHYSICS TO ENVIRONMENTAL INVESTIGATIONS

Presented by

JOHN LUTTINGER

Geomatrix Consultants, Inc.
Williamsville, New York

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We will convene on Thursday, November 12, at the Glen Loch Restaurant. The evening will conclude with an open question and discussion period with Mr. Luttinger. We look forward to seeing you then!

John Luttinger, a geophysicist from Geomatrix Consultants, Inc. will provide a presentation concerning surface geophysical methods.

A review will be presented on the applications of environmental geophysical techniques to hazardous waste investigations and hydrogeological studies. Environmental geophysics involves applying remote sensing techniques to map features of interest in the subsurface. These non-intrusive methods are commonly used in hazardous waste investigations to map buried areas of waste or define subsurface stratigraphy prior to implementing ground disturbance surveys such as test pits or soil borings.

Case histories will be presented where High Resolution Electromagnetic (EM) methods were applied to map buried waste lagoons and steel drums. An example of the use of deeper penetrating EM techniques are discussed as they pertain to mapping stratigraphy for a landfill expansion project. Seismic refraction and reflection techniques are reviewed and case histories discussed relative to mapping overburden stratigraphy and bedrock topography at a proposed hazardous waste facility and a landfill siting project.

Recent advances in geophysical techniques will be discussed. These include: the integration of geophysical tools with global positioning systems and the use and interpretation of azimuthal resistivity data to characterize bedrock fracture systems.

John Luttinger is a geophysicist with 9 years of experience in managing and performing geophysical projects. He holds BA and MA degrees in Geology, and a BS in Electrical Engineering, all from the University of Buffalo. Mr. Luttinger has extensive experience applying EM, magnetics, seismic reflection, seismic refraction, gravity, and ground penetrating radar techniques. Among the projects Mr. Luttinger has recently managed are a seismic reflection project over the collapse of Akzo Mine, New York; a seismic refraction project at the Plattsburgh Air Force Base, New York; an electromagnetic investigation at

the Olympic
View Landfill
in the Pacific

northwest; a micro-gravity survey over a salt dome in east Texas; a multi-technique geophysical investigation for a landfill expansion in Altamont, California; and a multi-technique geophysical investigation for Waste Management of North America, Inc. (WMI) in Denver, Colorado. He has participated in data collection, processing, and interpretation of large multi-technique geophysical investigations for WMI in the Mojave Desert of Eastern California; Sanifall, Inc. in Oregon; and for WMI near Los Angeles California. He is a member of the SEG, EEGS, and BAPG.

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PRESIDENT'S PAGE

The drive to work is now dark both on the way in and the way out. Once again, the day passes by the windows, or, if you are doing field work, you are outside gleaning the last of the warm season! Fall is a time when we see student geologists scurrying up rock faces on the highway and for completing field work and construction. No question about it, this fall has been quite favorable for field work and outside recreation. Ours is a most fortunate profession with the balance of two benefits: indoor preparation and outdoor activity. Geologists have this opportunity in several professional positions as well.

In reference to field work and no question about it: I had the opportunity to serve my jury duty sentence on a civil case this month. During jury selection, no questions were directed to me regarding experience on active "job sites." Prospective male jurors were questioned in depth as to their "job site" experiences; however, I was specifically questioned as to my husband's experiences, although he was not being considered to serve on the jury.

It appeared neither attorney assumed I, a geologist and a female, would be exposed to "job site" scenarios. I was curious as to the perception of what a *geologist* does at a place of employment described as Environmental Consulting and Engineering. Maybe it was the word consulting that makes one think about being in an office and

telling others your professional opinion on solving their problems. I am hoping for a more robust image.

Formally trained geologists are serving in many different professional capacities, as we know from the diverse group of individuals attending CNYAPG. In truth, I am not so sure the occupational description of geologist actually describes the professional role I serve on a day-to-day basis. Nonetheless, the foundation of scientific training, including critical thinking skills, serve well in life: technical education, practical experience, and a little blessing of luck and intuition.

As I considered the consequences of completing the job as a juror, I reflected on different functions we play in the professional arena. I was once told that geologists do not manage projects through remediation, particularly with respect to the engineering aspects. Since I know several individuals, geologists, managing all aspects of environmental projects, I found this statement implausible. Consider how many people in consulting take on various roles other than those specifically defined by their formal education and degrees. It was interesting how people from a variety of professions were transported into the job of juror, and in less than a week, work as a cohesive unit of jury.

I am particularly pleased that scientific education includes learning the ability to operate from changing perspectives and capacities. Who better than a person with a scientific education to consider the interaction of various contributing factors in making decisions and judgements? My

favorite question asked by the sharper of the two attorneys (in my opinion) was, if we would be able to put aside our personal experiences and opinions, wait until all evidence was presented, then make our decision drawing on reasonable judgement and our everyday personal experiences.

To the attorneys' credit, they did ask the jury an open-ended question, offering the opportunity to identify any information we thought they should know about us. Where do you start to answer such a question? Regardless, my experiences on job sites do not change my ability to serve as a fair and impartial juror. I was asked if I acquired information, compiled and assessed it, to make judgements, which I do. Given that, there was no way out of the jury box. There I was, a respected member of the legal system. Granted, it was a temp position...on an as-needed basis but, hey, the whole court room stood in respect when the jurors, entered. In some offices, a decent good morning comes only after coffee.

In the jury room, people were referred to by occupational titles as opposed to actual names. For example, one would say, "I don't know, ask the Librarian, or Carpenter, or Endangered Species Advocate, or Scientist." I felt like we were in a scene from *Gilligan's Island* with such character titles. I was given the Scientist title, designated spokesperson, and since I was the only one who brought a calculator, did the math when it came to determining the damages award. The Restaurant Owner brought in a cake, which was as necessary as the calculator to the collective.

Jury Duty: Just what I needed to do in the

midst of real life. Six days of critical information and data intermixed with the more prominent, insignificant information extraneous to the actual decision. As if there are not enough decisions to make and disputes to resolve that week as a project manager. But, I do love the process of law in action. I really did enjoy the art of courtroom language and presentation of the facts and opinion. A great deal of expert opinion was in play. For one week, I had to, under New York State Subpoena, consciously put aside my professional responsibilities, and decide the legal affairs of our community, at a billing rate of approximately \$5.00 an hour, paid in a lump sum fee of \$40 per day. Who could refuse?

See you at the meetings,
Vita DeMarchi, P.G.

Consider, would a geologist be a fair and impartial jury member in the following potential up-and-coming lawsuit: (as reported in the Herald American on Sunday, October 25, 1998): ***Pipeline blows, kills seven, injures four: A natural gas well in Bryceland, LA, exploded and caught fire Saturday afternoon, killing seven of the 13 workers on the crew and injuring four. the crew apparently was drilling for natural gas when the well blew.***

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GEOLOGIC NEWS

A Year with OCC's Geology Club

by Jen Wallace

To sum up the spirit of this group, one word comes to mind...ACTIVE! OCC's Geology Club has been involved in many interesting activities, from whitewater rafting, annual trips to the Outerbanks of North Carolina, to fossil hunting right in our own back yard. In fact, we unearthed an *Agoniatites vanuxemi* sample on the site of OCC's new technology building. The fossil's image now resides on the back of our club's t-shirts. All of our endeavors are in the pursuit of adventure and a desire to learn more about our natural geologic world

The past year (97-98), the Geology

Club offered many great experiences. In the fall, we embarked on a weekend of field trips in and around the Catskills with a group from SUNY Cortland. Traveling just south of Albany, we visited the Brauer research station and took trips to surrounding areas. It was both intellectually and socially stimulating to go into the field and share knowledge with students and professors alike.

As winter came upon us, we turned our focus to the classroom and held an informal speaker luncheon featuring several local geologists. This proved to be both interesting and informative, as we gained insight on possible careers and guidance on planning our futures in the field of geology. Encouraged by the success of our winter reception, we invited several more professionals to share an afternoon with us. Geology Club would like to again thank Vita DeMarchi, Nancy Gensky, Gerry Gould, Buck Gabriel, Sarah McCullough, and Dave

Palmerton for the meaningful discussion and entertainment that brightened our cold weather months.

The Outerbanks of North Carolina was the destination of our annual spring trip. This spring, our trip was quite an adventure for all who attended. We traveled by van down the coast and were ferried out to majestic Portsmouth Island. After three days on the island, we went inland to the vast expanse of a phosphate mine in Aurora, NC. The size of the mine was incredible, as well as the size of the fossilized sharks teeth that could be found there. Many returned home with near perfect samples. It was a true geologic treat!

We wrapped up our year in May with a tour of western New York. Camping at both Lechworth and Allegheny State Parks, we viewed the gorges and native geology. We swung past the shore of Lake Erie and collected perfect fossils of trilobites, brachiopods, and many other animals that

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were just popping out of the rocks and into our collection bags. It was great to relax and enjoy a few days of fossil collecting after a grueling week of finals.

Our Geology Club at OCC is just a small group of people who know how much to have fun, have a special way of looking at the world, and enjoy each other as much as they enjoy geology. We owe the diversity and high quality of our activities in part to our own efforts, but mostly to our wonderful friends and advisors at OCC: Meg Harris, Ed Ponto, and Fred Jaquin. I am confident this year will be even better than our last and will provide great things for all to experience.

NYSGA *by Meg Harris*

The 70th Annual Meeting of the New York State Geological Association (NYSGA) was held at Binghamton University October 2 - 4. Some of the familiar faces seen included Jerry Bastedo of the BAPG, Bill Kelly and don Cadwell representing the State Geological Survey, and from the CNYAPG, Jerry Zaykoski, George Kelley, Barb Hill, Nancy Craft, Fred Jaquin, Meg Harris, and a group of students from the OCC Geology Club.

Many opted for the Saturday field trip entitled "Finger Lakes Gorges Revisited," led by Peter Knuepfer and Tim Lowenstein of SUNY Binghamton. Enfield Glen was the most talked-about park visited and many were impressed with a stop to see prograding deltaic deposits. A field trip to Schoharie County to see Devonian fluvial to shallow marine strata allowed participants to see sand bodies with trough crossbedding, current ripple marks, many types of burrows, and interbedded storm deposits along with terrestrial deposits of paleosols with root casts overlain by the famous Gilboa tree trunk molds and casts. The leaders of this trip, Scott Jarvis and John Bridge, followed Saturday's trip with a workshop on Sunday analyzing drill core samples take from the area visited. Other trips receiving good reviews included a workshop on Environmental geophysics held at a local landfill, and a survey of the best outcrops in the Susquehanna and Mohawk Valleys.

Dr. Richard Alley, of Penn State, delivered the keynote address at Saturday night's banquet. He described his years of work on the Greenland ice coring project. The field conditions were incredible to imagine, especially the "Johnny-on-the-Spot" in sub-zero weather! We were all

taken with the idea of carving one's own laboratory space from the bowels of a glacier that goes back thousands of years, allowing us to see a pattern of climate change that appears to show relative stability during glacial and interglacial periods but wild fluctuations during transition between the two. The lesson taken might be that when things start to take a turn, change can happen much more quickly than we had ever expected.

Next year's meeting will be hosted by SUNY Fredonia. The new president, Gordon Baird, has promised a wide array of field experiences in western New York for us to pick from. Hope to see you all there!

NY Remnant Volcano Site Local Field Trip Potential

Saratoga County is the home the only known volcanic rock, the remnant of a volcano that erupted more than 370 million years ago. The aged volcano, named locally as "Stark's Knob" is located approximately 1 mile off Route 4, just north of the village of Schuylerville, on a dirt road marked as Stark's Knob Road. The site is named after John Stark, the Revolutionary War general who erupted his cannons from atop the volcanic hill in 1777. Historian say the "knob" was up to 100 feet higher back than. None the less, Stark's knob is the highest spot in the town of Northumberland, offering a spectacular view north to the Adirondacks and east to the Hudson River and Green Mountains of Vermont. The volcanic basalt was chiseled away in quarrying operations that supplied gravel for nearby railroad beds. Although the volcanic rock has been reduced, it gives geologists a better cross-sectional view. Geologists agree the volcano erupted beneath ocean waters, with lava hardening into pillow-shapes. There remains some disagreement about where the volcano actually erupted. Some geologists maintain it erupted in Northumberland; others suggest the eruption happened elsewhere and was transported during tectonic activities.

Geological Processes Imitate Life

Forms

As an update to Dr. Cathy Newton's CNYAPG January 1997 presentation: StarDate Online reports that scientists are continuing their assault on claims that a rock from Mars contains evidence of past microscopic life on the Red Planet. After analyzing samples of the rock, many scientists say the evidence of life was really produced by natural geological processes on Mars, or contamination on Earth.

In 1996, researchers from Stanford University and NANA's Johnson Space Center reported evidence of life in a meteorite discovered in Antarctica. All scientists agree that chemical tests show that this cosmic rock came from Mars. Evidence of past microscopic life included small blobs of carbon-based chemicals, magnetic minerals, and microscopic structures that look like fossils.

Several research teams have refuted individual pieces of evidence. One of the most recent reports came from researchers Hap McSween, Ralph Harvey, and John Bradley, who examined a small piece of the meteorite with an electron microscope. Their research showed that the carbon blobs and the magnetic minerals grew together in layers as the result of natural geologic processes, and were not produced by microscopic organisms.

More News from Mars
from **StarDate** **Online** at
[http://pio.as.utexas.edu/radio/
s_radioscript.html](http://pio.as.utexas.edu/radio/s_radioscript.html)

More Martian Geology

An article from the BBC News Online Network states that scientists are learning about the volcanic past of Mars by studying the smallest volcanoes on the planet. Mars is a world of grand mountain ranges, deserts with shifting sand dunes, vast canyons that dwarf anything found on Earth, and huge extinct volcanoes three times the height of Mt. Everest. Recently, the orbiting Mars Global Surveyor spacecraft focused on a small "shield" volcano and has obtained the

first close-up images. Planetary geologists believe that it may hold important clues about Mars' more active geological past.

Leonid Meteor Storm & Earth's Space Technology: Clash of the Titans?

The November 17 Leonid meteor storms will present an elevated, though not serious, threat to spacecraft in the vicinity of the Earth for about a half-day, according to Department of Defense and NASA experts who have been studying the potential risk to spacecraft.

The annual Leonid shower, this year a storm, is expected to have an intensity not seen in more than three decades. Even so, the event could provide a dramatic "light show" for some parts of the world, particularly East Asia and the western Pacific region. The Leonid meteors originate from the debris released from the Comet Tempel-Tuttle which completes an orbit around the Sun every 33 years, leaving a trail of debris such as dust and other tiny particles. The Comet passed perihelion, its closest approach to the Sun, early in 1998, setting the stage for probable meteor storms in 1998 and 1999.

The peak of the 1998 shower or storm is expected at about 19:45 UT on November 17, that for the 1999 event should occur at 1:50 UT on November 18, and that for the 2000 Leonids should be on November 17 at 8:05 UT. One should expect the duration of the storms (when they occur) to be about 7 hours or so, centered on the peak. We can estimate that the Leonids will show a rate of somewhere between 500 and 10,000 meteors per hour, with the best guess being about 5,000 per hour.

The point from where the Leonid meteors appear to radiate is located within the constellation Leo and is referred to as the radiant. To best observe the Leonids, wear appropriate clothing for the weather. Lay outside in a reclining lawn chair with your feet pointing towards the east (the general direction of the radiant). Do not look directly at the radiant, because meteors directly in front of you will not move much and fainter ones may be missed. Instead, keep your center of gaze about 30 or 40 degrees above or west of the radiant. The Leonids can be observed right into morning twilight.

Check the following Web sites for more information: www-space.arc.nasa.gov/~leonid and www.spacecom.af.mil.

The Dating Game

Research conducted by geoscientists from the Massachusetts Institute of Technology and the National Museum of Natural History (GSA Today, Vol. 8 No. 9) suggests the absolute age of lithified volcanic ash beds can be "determined" (perhaps more appropriately "estimated") to uncertainties of less than one million years through application of uranium-lead dating on zircons separated from the ash beds.

This research may be applicable to the study of rates regarding evolutionary radiations, mass extinctions, and other evolutionary events. Reported applications include evidence that the exotic, soft-bodied Ediacaran organisms immediately underlie (predate) the Cambrian explosion and that the Cambrian explosion may have lasted less than 10 million years. New data also suggest the Cambrian explosion occurred approximately 543 million years ago instead of the typically mentioned date of approximately 590 to 570 million years ago. Additionally, studies employing the new technique suggest the profound mass extinction at the end of the Permian lasted less than 1 million years.

November 4-6, 1998

Annual NYS Industry-Environment Conference, Sheraton in Saratoga Springs, New York. Call (518) 584-4000 for information.

November 12, 1998

CNYAPG Meeting @ the Glen Loch Restaurant in Jamesville. Mr. John Luttinger of Geomatrix Consulting, Inc. will be our guest speaker. come early and enjoy a cash bar, followed by dinner at 6:15 p.m. The presentation will begin at 7:15 p.m.

November 17, 1998

Leonid Meteor Storm: visible after 2:45 pm est

December 10, 1998

CNYAPG Meeting @ the Glen Loch Restaurant in Jamesville. Mr. Michael Coia, Director of Remediation at Phytoworks, Inc. will be our guest speaker. He will discuss utilization of plants to reduce concentrations of organic and inorganic constituents, including mercury, in soil and water. He will present applications of this innovative treatment technology. Check out the PhytoWorks Web site in advance at www.phytoworks.com.

January 14, 1999

CNYAPG at a possible new location. Kevin Bernstein, Esq., with Bond, Schoeneck & King, will discuss the professional working relationship between geologists, engineers, and attorneys. CNYAPG will invite members of the local ASCE to join us.

February 12, 1999

CNYAPG will host a **Geology Student Poster Session**, in addition to a guest speaker at the February meeting.

April 1998

CNYAPG Walking Tour with Mr. Bob Preyer of the MOST. Tour downtown Syracuse, reflecting on the geologic origins of local buildings and stone work. The tour will conclude with dinner and a guest speaker at a downtown location.

Directions to the GlenLoch

What Next?

Do you have any ideas for a CNYAPG sponsored Spring Field Trip or Seminar? Let us know at www.dreamscape.com/cnyapg.

CUT & PASTE
MAP HERE

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarchi@secor.com.

* CONTRIBUTIONS TO THIS MONTH'S
CNYAPG NEWSLETTER
WERE MADE BY:
Vita DeMarchi Meg Harris
Jon. S. Fox Jen Wallace Gerry Gould
Buck Gabriel Georgia Popoff

TAKE NOTE: Due to an increase in dinner costs, dinner is not \$15.00 if reserved 24 hours in advance and \$17.00 at the door. Make your reservations today by calling

O'Brien & Gere Engineers at (315) 437-6100, extension 2656.

CNYAPG NEWSLETTER SUBSCRIBER 1998

The Board Members would like to thank all of the corporate and individual supporters of CNYAPG throughout the past year. We would like to encourage you to continue your pledge of support throughout the upcoming year. Contact Steve Crook at (315) 437-1429 or (518) 827-5720 details.

OCTOBER 1998

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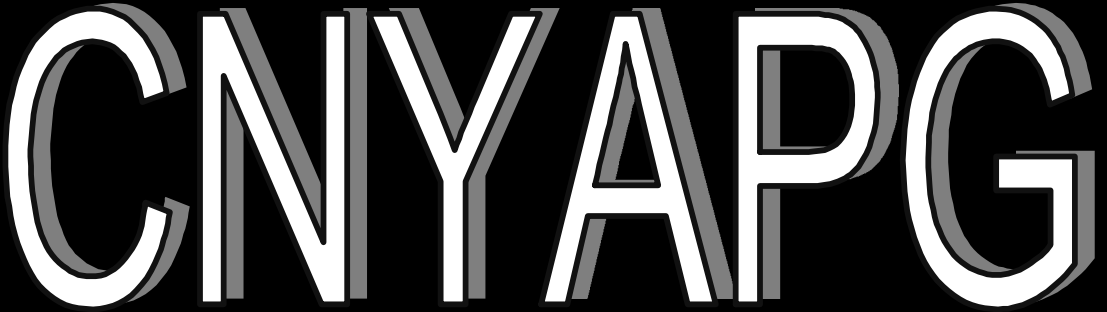
CNYAPG

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The CNYAPG was founded in 1993 to strengthen and advance the geologic sciences as a profession and to provide an open forum for the exchange of ideas; to promote the protection of public welfare through the professional practice of geologic sciences; to inspire and maintain the highest standards of professional conduct, business ethics, and personal honor of the membership; to foster the spirit of scientific research throughout the membership; to publish and otherwise disseminate information related to the geologic sciences and associated technologies; to maintain and encourage intra- and inter-association activities, to enhance the association's programs, and to encourage the affiliation of individual members with other scientific and technical organizations.

OCTOBER 1998



PHYTOREMEDIATION APPROACHES FOR ORGANIC AND INORGANIC CONTAMINANTS

Presented by

MICHAEL COIA

PhytoWorks, Inc.

Teaching Plants to Improve Our Lives™

Gladwyne, Pennsylvania

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**CNYAPG
Calendar 5**

We will convene on Thursday, December 10, at the Glen Loch Restaurant. The evening will conclude with an open question and discussion period with Mr. Coia. We look forward to seeing you then!

**C N Y A P G
welcomes members
of ASCE!**

After more than five years of conferences, scientific papers, trade review articles, and high expectations, how is phytoremediation "stalking up?" Phytoremediation has been implemented on more than 100 commercial sites. Although completed projects are still rare, available data from ongoing projects and demonstration sites show significant progress toward achieving cleanup and containment goals. Scientific research has also expanded the suite of contaminants that phytoremediation can address to include mercury, explosives, pesticides, chlorinated solvents, PAHs, and PCBs. In the intensely competitive environmental industry, phytoremediation technologies are demonstrating benefits to all stakeholders by decreasing costs to responsible parties, increasing margins for environmental consultants, garnering community support, and meeting or exceeding regulatory standards.

Michael Coia, director of Remediation at PhytoWorks, Inc., will present the state of the phytoremediation industry at CNYAPG's December meeting. Mr. Coia will discuss available phytoremediation approaches for organic and inorganic contaminants, including PhytoWorks' patented transgenic plants which detoxify methylated and ionic mercury contamination. Drawing on over 18 years of experience in environmental management and engineering, Mr. Coia will compare phytoremediation with competing technologies and demonstrate how phytoremediation can be implemented as an alternative or complement to mechanical approaches. Mr. Coia, who also lead the interactive workshop at Central Business Intelligence's (CBI's) November Phytoremediation Conference in New Orleans, will answer questions about phytoremediation and looks forward to a stimulating and interactive evening with CNYAPG.

Michael Coia has more than 18 years of experience in all phases of environmental remediation, including system design, engineering staff line management, contracting, project management, and fiscal planning. Most recently, he directed the Technical Services Group of 130 engineers and technicians for the Northern Region of OHM. Mr. Coia was one of four founding partners and Program Director for Environmental Resource Management's (ERM's) remediation affiliate, where he was responsible for developing and implementing remediation solutions and directing 25 engineers and project managers. Previously, he was a project manager and field engineer at Roy F. Weston, where he participated in some of the first laboratory and field demonstrations of innovative soil vapor extraction and lagoon stabilization/closure technologies. Mr. Coia was awarded his B.S. and M.S. from Duke University.

PRESIDENT'S PAGE

I, for one, am looking forward to December's talk on Phytoremediation. The concept of using plants as a remedy seems an obvious one. Having worked on many classified hazardous waste sites, it is clear that plants manage to grow, despite the surrounding air, soil, and groundwater quality. Railroad tracks are a good example. Plants, berries, and moss grow quite well in soil that potentially, when characterized on an environmental site, needs to be excavated for off-site disposal. The local Solvay beds are another good example of plants growing where we would least expect them, based on office-calculated risk assessments.

Being a perennial gardener and herbalist, I understand that it is declared that plants turn into weeds when they grow where one does not want them. It is the observation of plants and weeds growing where we do not want them or where we would not expect that needs to be paid attention to. Going back to the railroad track example, certain plants I have harvested from railroad tracks and restored to the garden showed indications of "detoxification." I have observed black oily-like liquid discharging from stems and flowers in only those plants taken from railroad tracks and not the regular garden variety. These observations entice me to believe the plants are processing the soil constituents from the shallow railroad beds. And if they are, how can this process benefit us?

I was noticing the trademark phrase from PhytoWorks, "Teaching Plants to Improve Our Lives." Although I fully agree, plants have been used throughout history to remedy and improve our lives. Their use was, and still is, primarily in the remedying of human ailments; as medicine.

By observing and studying their actions on the body and environment, they are actually our teachers. Then, when we understand their physical and chemical behavior, they become our

tools. By altering their naturally-occurring processes, we enhance the tools to meet specific objectives.

It is interesting to observe that plants and herbs are also growing in popularity as a remedial medicine for common and complicated human body impacts. The cover of the November 28, 1998 issue of Time magazine reads, "The Herbal Medicine Boom...It's great business, but is it good for what ails us?" Even Robitussin has come out with an herbal-based children's remedy sold over the counter for coughing. Only a few years back, the use of herbs as a chosen remedy in the U.S. was limited to "alternative" lifestyle people. Will phytoremediation cultivate into good environmental business in the future? In the beginning, applications of environmental phytoremediation will propagate with the few innovative parties willing to risk and pay for furthering the development of an alternative technology.

An attorney once made the analogy between the goals of an environmental geologist and a medical doctor; the difference being the remedied media - human vs. environment. A medical doctor completes an exam on a human client in much the same way a geologist/scientist/engineer completes a remedial investigation. There are both intrusive and non-intrusive methods of obtaining required samples and data to determine the physical and chemical nature of a system. Once the system/site is characterized/diagnosed, the remedy is selected based on considered criteria, including effectiveness, time, and cost. If increased environmental use and profitability of plants parallels the historic medical use, I suspect there will be a few "snake-oil treatments" being "petaled" at the remedial market place.

The trend is there, plants are gaining ground as a recognized remedy for human bodies and the environment. As plants expand into environmental remedies, I suspect a lag time between daring few voluntary employments to being an accepted remedy in a feasibility study.

Phytoremediation can be considered as a secondary remedy, used in association with other physical and chemical methods to reduce risk. Of course, with any remedial technology, pilot tests and studies will need to be conducted to prove effectiveness. Responsible parties will have to decide the cost effectiveness of using plants vs. implementing a proven technology. Although, the use of plants to remediate surface soil and reduce risk would appear to be an inexpensive remedy, the extended costs of operation and maintenance (planting and harvesting) and confirmatory sampling may increase the costs in the long run. The long run may be too long to justify the commercial worth and liability of the property. The role of project managers will require an understanding of more processes and how they interact (and what the real cost is).

As plant remediation grows into the feasibility study status, also will the role of biologists in environmental remediation. The table will continue to be expanded as resolving environmental issues evolves to include more disciplines. Will there be a time when biologists hire a lobbyist to push forward their need for Professional Biologist (P.B.) registration?

All said, it is still amusing and pleasing to envision a fenced off area with a sign indicating, "no public access - hazardous waste area," and inside is a fully vegetated area of flowering plants. Add two Tyvek-suited samplers with monitoring equipment for effect.

Maybe the proclamation for the new millennium should be *Carpe Phyto*.

Happy Holidays and New Year,

Vita DeMarchi P.G.

GEOLOGIC NEWS

A New Gold Rush?

from Jon S. Fox

Geoscientists in New Zealand have reportedly induced certain plants to accumulate relatively large concentrations of gold from ores through application of ammonium thiocyanate (Chemical and Engineering News, 12 October 1998). The plants include members of the mustard family and chicory. This implies that "biomining" of gold and possibly other elements may be possible, even profitable, under certain environmental conditions. These so-called "bio-ores" have reportedly contained gold at a concentrations up to 150 parts-per-million (ppm) after incineration of the biomass. Research suggests that the economic "break even" point is realized at a gold concentration of only 17 ppm.

For more information on the utilization of plants to manage levels of organics in soil, come to the CNYAPG December meeting (see Calendar).

News from the Net:

Boning Up on The Basics

Phytoremediation is a system whereby certain plants, working together with soil organisms, can transform contaminants into harmless and, often, valuable forms. This practice is increasingly used to remediate sites with heavy metals and toxic organic compounds.

Phytoremediation takes advantage of plants' nutrient utilization processes to take in water and nutrients through roots, transpire water through leaves, and act as a transformation system to metabolize organic compounds, such as oil and pesticides. Or they may absorb and bioaccumulate toxic trace elements, such as the heavy metals, lead, cadmium, and selenium. In some cases, plants contain 1,000 times more metal than the soil in which they grow. Heavy metals are closely related to the elements that plants use for growth.

This affordable technology is most useful when contaminants are within the root zone of the plants (top 3 to 6 feet). For sites with contamination spread over a large area, phytoremediation may be the only economically feasible technology. Adding to it's affordability is the usage of the same equipment and supplies used in agriculture.

Ilya Raskin and his interdisciplinary team at Rutgers AgBiotech Center were the first to demonstrate the utility of certain varieties of mustard plants in removing such metals as chromium, lead, cadmium, and zinc from contaminated soil.

Plants can accelerate bioremediation in surface soils by their ability to stimulate soil microorganisms through the releases of nutrients from and the transport of oxygen to their roots. The zone of soil closely associated with the plant root, the rhizosphere, has much higher numbers of metabolically active microorganisms than unplanted soil. The rhizosphere is a zone of increased microbial activity and biomass at the root-soil interface that is under the interface of the plant roots. This symbiotic relationship between soil microbes is responsible for the accelerated degradation of soil contaminants.

Compounds are frequently transformed in the plant tissue into less toxic forms or sequestered and concentrated so they can be removed (harvested) with the plant. For example, mustard greens were used to remove 45% of the excess lead from a yard in Boston to ensure the safety of children who play there. The sequestered lead was carefully removed and safely disposed of. Besides mustard greens, pumpkin vines were used to clean up an old Magic Marker factory site in Trenton, NJ. Hydroponically grown sunflowers were used to absorb radioactive metals near the Chernobyl nuclear site in the Ukraine and a uranium plant in Ohio. The mustard's hyper-accumulation results in much less material for disposal. The composting of plant material can be another highly efficient stage in the breakdown of contaminants removed from the soil.

When trees are used, such as poplars, the idea is to move as much water through them as possible, so that they take up as much of the contaminants as possible. Once the heavy metals are absorbed, they are sequestered in the trees' roots. Any organic compounds that are absorbed wind up being metabolized.

Cleaning the top 15 centimeters (6 inches) of contaminated soil with phytoremediation costs an estimated \$2,500 to \$15,000 per 2.5 acres, compared to \$7,500 to \$20,000 for on-site microbial

remediation.

Plants effectively remediate soils contaminated with organic chemical wastes, such as solvents, petrochemicals, wood preservatives, explosives, and pesticides. The conventional technology for soil clean-up is to remove the soil and isolate it in a hazardous waste landfill or incinerate it.

Salt-tolerant plants, called halophytes, have reduced salt levels in soils by 65% in only two years in one project involving brine-damaged land from run-off from oil and gas production in Oklahoma. Perhaps it should be a consideration for Onondaga County roadsides in the Spring.

The establishment of vegetation on a site also reduces soil erosion by wind and water, which helps to prevent the spread of contaminants and reduces exposure of humans and animals.

Further Proof That Trees are Our Friends

The growth rate of Loblolly pines in a North Carolina forest increased by 12% when the trees were exposed for one growing season to carbon dioxide levels projected for 50 years in the future, according to initial data gathered in a study by a team of scientists from the University of Illinois, Duke University, the Brookhaven National Laboratory, and West Virginia University.

Evan DeLucia, of the U. of I., remarked, "We may need to put more focus on the issue of soil management so carbon dioxide can be stored in the ground. The key is long-term, locked-up storage below ground. Everything we see aboveground will end up back in the atmosphere in one or a few human lifetimes. All of it will die and decompose. Trees are short-term carbon storage. Carbon must go into soil to remove it from the atmosphere."

According to DeLucia, trees can use higher levels of carbon in photosynthesis, but the question is how much more can they use and ultimately store. For further info, refer to the following Web sites:

<http://www.admin.uiuc.edu/NB/98.09/TreesCO2.html> and <http://www.sciencedaily.com/releases/1998/09/9807115650.htm>.

Hybrid Poplars Thirsty for Heavy Metals and Solvents

The Associated Press reports that cleaning up polluted industrial sites may not require billion-dollar government programs. Instead, scientists are suggesting that we plant poplar trees.

Laboratory-designed hybrids of the fast-growing poplar tree have been found to act like 100-foot straws, sucking contamination from soil and groundwater.

In turn, the tree either safely stores the chemicals in its tissues or metabolizes them into less volatile compounds. The tree then releases these byproducts into the atmosphere through its leaves as vapor.

Although it takes several years to complete, this natural cleanup method is inexpensive and may work as well as high-tech soil roasting and groundwater filtering, while maintaining green space.

Researchers even believe that phytoremediation may transform industrial and government agency treatment of long-term pollution problems, which currently are estimated at more than \$200 billion nationwide.

The drawback is that it is still unknown whether the chemical byproducts generated by the poplars are, in fact, less harmful, or if diluting them in the atmosphere only creates another hazard. David E. Salt, an environmental chemist at Northern Arizona University, stated, "We may soon be using trees to heal the hurt inflicted on the Earth, but would we simply be exchanging soil pollution for air pollution?"

However, one study, published in the October issue of *Nature Biotechnology*, showed that research for a team at the University of Georgia were able to genetically engineer the yellow poplar to a tenfold increase in mercury resistance and its ability to transport it through its root system and tissues, reduce it to a less volatile form, and release it into the air. The hybrid has not yet been planted in field tests, however.

The yellow poplar, which grows primarily east of the Mississippi River, is one of the largest and most commercially valuable hardwood trees. It is favored for phytoremediation for the same reasons that make it popular with commercial foresters, plywood manufacturers, and neighborhood landscapers.

The yellow poplar, also known as the tulip poplar, grows up to 15 feet per year and absorbs 25 gallons of water per day. With broad green leaves measuring up to 6 square inches, there is plenty of leaf surface available to release processed contaminants. The poplar also has an extensive root system and is very resistant to everything from gypsy moths to toxic wastes. The poplar gives every appearance of being a true survivor and a major asset in aiding the earth in cleaning itself up.

Lithoprobe in Canada Answers More Questions

Geologist and geochemists from the University of British Columbia, the University of Calgary, and the Centre de Recherches Petrographiques et Geochimiques in France (GSA Today, Vol. 8, No. 10) have been involved with the Lithoprobe project, a geological research project of respectable scope and funding sponsored by the Canadian government (bless our knowledgeable neighbors to the north). The primary goal of the Lithoprobe project is to investigate continental evolution over extended periods of geologic time. A comprehensive synthesis of the project is tentatively scheduled for publication in 2003. Data collected suggest the southeastern Superior province of the Canadian shield in Quebec (adjacent to New York) developed through tectonic accretion in a subduction zone, which progressively stepped south through Late Archean time (approximately 3.6 to 2.4 billion years ago).

Meanwhile, on the Homefront: Membership Renewal Time is Here

CNYAPG Members: it is time to renew your memberships. Renewals are still a low **\$20 per year**.

As you may recall, all CNYAPG memberships expire on December 21st. All current members should be receiving renewal forms with this newsletter. The forms will contain the information we currently have on file for you and your membership expiration date. Please make the necessary additions or changes to the forms and return them with your \$20 dues, made payable to CNYAPG.

Those of you who previously paid multi-year memberships will also receive a renewal form. Please check the expiration date and make corrections to your personal information as may be necessary. If all information is current, and you are paid up, you need not return the form.

If you do not receive a form, or know of a potential new member who needs a membership application form, you may download it from our Worldwide Web Site at www.dreamscape.com/cnyapg or call Gerry Gould (CNYAPG Secretary) at 437-1142 (feel free to fax a request to Gerry at 437-1282 also).

What Next?

Do you have any ideas for a CNYAPG sponsored Spring Field Trip or Seminar? Let us know at www.dreamscape.com/cnyapg.

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarchi@secor.com.

Special Note: We need a short course/seminar committee to work on a program for Fall 1999. Your input and volunteer time will be greatly appreciated by all members!

✳ CONTRIBUTIONS TO THIS MONTH'S CNYAPG NEWSLETTER WERE MADE BY:
Vita DeMarchi Jon. S. Fox
Gerry Gould
Buck Gabriel Georgia Popoff

December 10, 1998

CNYAPG Meeting @ the Glen Loch Restaurant in Jamesville. Mr. Michael Coia, Director of Remediation at Phytoworks, Inc. will be our guest speaker. He will discuss utilization of plants to reduce concentrations of organic and inorganic constituents, including mercury, in soil and water. He will present applications of this innovative treatment technology. Check out the PhytoWorks Web site in advance at www.phytoworks.com.

January 14, 1999

CNYAPG and ASCE join to welcome Kevin Bernstein, Esq., with Bond, Schoeneck & King, will discuss the professional working relationship between geologists, engineers, and attorneys. Dr. Bill Kelly, president of the New York State Council of Professional Geologists (NYSCPG) will give an overview of professional geologist licensing status. The meeting location will be announced next month.

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CNYAPG will host a **Geology Student Poster Session** (location to be announced). Meg Harris is coordinating with regional colleges and universities to bring up-and-coming geologists for the opportunity to meet and mingle with CNYAPG professionals. Dr. Bill Kappel of the USGS will give an update on Tully's Bear Mountain Study and set forth an offer to be involved (as a volunteer) in future research.

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May 1999

CNYAPG Walking Tour with Mr. Bob Preyer of the MOST. Tour downtown Syracuse, reflecting on the geologic origins of local building materials and stone work. The tour will conclude with dinner and end-of-year party at a downtown pub location.

Directions to the Glen Loch



**CUT & PASTE
MAP HERE**

TAKE NOTE: Due to an increase in dinner costs, dinner is now \$15.00 if reserved 24 hours in advance and \$17.00 at the door. Make your reservations today by calling O'Brien & Gere Engineers at (315) 437-6100, extension 2656.

The Board Members would like to thank all of the corporate and individual supporters of CNYAPG throughout the past year. We would like to encourage you to continue your pledge of support throughout the upcoming year. Contact Steve Crook at (315) 437-1429 or (518) 827-5720 details.

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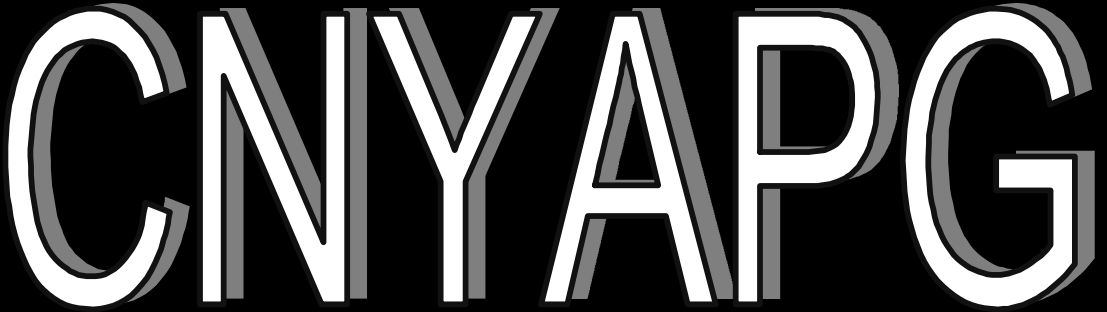
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CNYAPG MISSION STATEMENT

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**CNYAPG and ASCE Joint Meeting:
HOW ATTORNEYS AND CONSULTANTS CAN WORK TOGETHER
PRODUCTIVELY - WITHIN OR OUTSIDE THE COURT ROOM**

Presented by

KEVIN M. BERNSTEIN, ESQ.

Bond, Schoeneck & King, LLP

Syracuse, New York

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We will convene on Thursday, January 14 at 6 PM, at the Marriott in Carrier Circle for a joint meeting with the ASCE. The meeting will conclude with an open question and discussion period. We look forward to seeing you then!

Just as being a practicing attorney is not usually taught in law school, being a consultant or expert witness is not usually taught as part of a consultant's professional training (whether the consultant is a geologist or engineer). Unfortunately for consultants, working with attorneys is a fact of life. Whether there are environmental legal issues involved or a matter is headed to court, attorneys always seem to be involved. However, this fact, unfortunate or not, can still result in a productive team working environment, as long as each professional knows the boundaries of their expertise.

Once the scene shifts to the court room or hearing room, the consultant should work closely with the attorney on things not taught at school or even in the ordinary course of a consultant's professional life - things like protecting documents under the attorney-client privilege, testifying under direct **and** cross examination, making the proper impression on a judge or jury, rehearsing and preparing prior to actually testifying, and volunteering on subjects or topics that are outside the scope on the issues being addressed, or worse, outside the scope of the consultant's expertise.

Mr. Bernstein will talk about some of the different areas of the law in which geologists and engineers and attorneys (solid waste, wetlands, and mining) work together, what expectations attorneys and consultants should have of each other when working together, and the different ways attorneys can utilize the expertise of consultants. Mr. Bernstein will focus on utilizing a consultant as an expert witness and how a consultant can be an effective witness.

Kevin Bernstein is a partner in the environmental practice group at Bond, Schoeneck & King, LLP. He has extensive environmental experience with matters involving solid and hazardous waste, petroleum contamination, PCBs, wetlands, landfill permitting, mining, wastewater treatment, hazardous substance and petroleum storage tanks, SEQRA, and in defense of claims asserted by federal and state governmental agencies for cleanup costs, penalties, and other relief under federal and state Superfund statutes, New York State Navigation Law, and the Clean Water Act.

Mr. Bernstein also has extensive experience in toxic tort litigation, and defending environmental criminal investigations. Mr. Bernstein has been involved in a number of trials or hearings at which experts with a geology/hydrogeology or engineering background have testified. Prior to joining Bond, Schoeneck & King, LLP, Mr. Bernstein was associated with another local law firm and, before that, he was a law clerk for a federal judge and a faculty member at Vermont Law School, his law school alma mater.

In addition, Dr. William Kelly, President of the New York State Council of Professional Geologists will present an overview of the organization's efforts to achieve professional licensure for geologists in New York State.



PRESIDENT'S PAGE

A **thank you** goes out to everyone who participated in December's dinner talk by Mr. Michael Coia of PhytoWorks. I enjoyed the extensive question and answer session where we speculated and envisioned future applications of phytoremediation. It demonstrated again that scientists are creative by nature, or can be creative with nature. CNYAPG had a nice turnout and a lot of fun. **We hope to see more of our members together at the joint meeting with ASCE on January 14 at the Marriot at Carrier Circle in Dewitt.**

At a recent business lunch, I mentioned the upcoming CNYAPG January speaker topic concerning the working relationship between geologists, engineers, and attorneys. Seated with me, the "geologist" by technical trade, were one attorney and one engineer who just looked at each other and poised confused looks. They were amused that such a frequent business situation would be basis for a speaker presentation. For many professionals, the interaction among these professionals is common ground. However, for many of us, the role of geologist or engineer is oriented around completion of a technical task. Seldom is the engineer or geologist directly involved in the negotiations that advance a project to completion. For many, interaction between disciplines is not common and the varied perspectives each profession contributes are not shared.

Some of the more useful words of advice told to me early in my consulting career by an engineer project manager advised that the best means to success is not by personally knowing the answer to all project questions, but knowing who does. I share this here because it reminds me of the working relationship between scientist, engineers, and attorneys. Each discipline brings a unique perspective to a project. My experience has been that attorneys were often participating as project managers on behalf of a client. Given that project concerns are often driven by technical issues, attorneys demonstrated the ideal role of project manager: knowing from whom to

get the right information. Luckily for consultants, it is us. As we know, project managers, expert witnesses, government agency representatives, and clients consist of professionals from varied technical and business disciplines, including engineers and geologists. From many perspectives, attorneys, engineers, and geologists function as a cohesive team working together. **Please join CNYAPG and ASCE on January 14, 1999 as Kevin Bernstien provides an attorney's perspective on the working relationship between geologist, engineers, and attorneys.**

Given the now-standard occurrence of geologists involved in project management issues that include making decisions that affect public health and welfare, whether it be in consulting, in private industry, government organizations, or in academic research, it seems almost amusing that our professional status in New York State is not legally recognized. I do support the licensing of geologists for a number of reasons. But honestly, the most prominent reason is because, by not having the license, it is difficult to conduct environmental business in NYS. Geologists need to ask engineers to sign and review work products that may be beyond their expertise just to be able to submit documents to the NYSDEC. Who's best interest does that serve?

In many ways, I find the licensing system a hindrance. For example, in consulting, if a client has a project issue in another state, obtaining reciprocity to conduct professional business includes completion of significant paper work, money, and time, an element not always available. Sure enough, each state needs the same personal information presented in a slightly different format. I agree that state-by-state licensing is the first step for geologists, however, I aspire to a national program in which professional information can be accessed and one professional title serves an individual in any state. If obtaining a professional license is to provide legal responsibility and accountability to the public in matters that affect human health and welfare, then how does this objective

change in any given state?

I realize that this same state-by-state system serves engineers and attorneys. We, as geologists, need to be on equal professional standing in the legal and business system. Therefore, we need licensing in New York State. Although I agree in theory that licensing assists in monitoring professions that have a direct affect on making public health and welfare decisions and infers that appropriately qualified professionals make such decisions, I am, in principle, not for additional government regulation. It appears to me to be more of a necessary business component than an idealistic means to ensure that public health and welfare is maintained by qualified people. Personally, I support licensing because it is already established in other states and, from a business perspective, we need to be on equal status with other professionals seated at the environmental consulting negotiation tables.

I am strongly suspect of the environmental professional programs set into action in Connecticut and Massachusetts. This process has taken the state by state interest issue to the extreme. I view these programs as elitist with the purpose of generating revenue for bureaucratic arenas. For those who read the NYSCPG newsletter article updating the meeting with the NYS Education Department, it is apparent that money is a significant issue in passing licensure in NYS.

Enough of my brief opinion on the issues, **please join CNYAPG on January 14, 1999, when Dr. William Kelly, NYSCPG President will give us an overview of the current licensure status.** CNYAPG welcomes your opinion on the topic; bring your questions and comments.

I regret that I will not be joining you at the January meeting. I hope everyone enjoys the evening.

Best Wishes for Success in 1999,

Vita DeMarchi P.G.
CNYAPG President

GEOLOGIC NEWS

In the Know...

with Jon S. Fox

Arsenic Tragedy: A Compelling Argument for the Importance of Geologic Input into Resource-Based Public Health Decisions

An extensive arsenic contamination event in Bangladesh and portions of western India has been described as "probably the most extensive mass poisoning in history" (*Chemical Engineering and News*, Vol. 76, No. 46). As many as 70 million people have been ingesting groundwater with arsenic concentrations as high as 2,000 parts per billion (ppb). The current World Health Organization guideline for arsenic in drinking water is 10 ppb. Hundreds of thousands of people have been diagnosed with arsenicosis (chronic arsenic poisoning) which can be fatal if left untreated. The tragedy is an unexpected result of well-intended efforts to assist the people of Bangladesh and western India through the installation of water supply wells. Many of the wells were installed with funding from the United Nations Children's Fund (UNCF) beginning in the 1980s to control and minimize the spread of disease through contaminated surface water supplies previously used as drinking water sources. However, UNCF never thought of sampling the aquifers for elevated concentrations of naturally-occurring metals (one would guess that a geologist or hydrogeologist was not a member of the UNCF committee that developed the program).

The initial working hypothesis regarding the cause of the contamination was that withdrawal of large volumes of groundwater lowered regional water tables and exposed pyrite naturally present in the unconsolidated sedimentary aquifers to oxidation, forming relatively soluble arsenic-containing oxyphyrites. However, recent research suggests the condition may be typical of an anoxic sedimentary aquifer where arsenic-rich iron oxyhydroxides are reduced to a more soluble state by reaction with organic matter. Several remedial technologies are being contemplated for the area, mostly centering on simple

aeration of influent groundwater, forming iron hydroxides precipitates which should scavenge arsenic out of the water.

Radon Ingestion vs. Inhalation

A recent report compiled by the National Research Council (NRC) entitled "Risk Assessment of Radon in Drinking Water" suggests radon in groundwater poses few risks to human health (*Environmental Science and Technology*, Vol. 32, No. 23; *GSA Today*, Vol. 8, No. 11). Radon is a byproduct of the radioactive decay of uranium occurring naturally in soil and rock, particularly in shale-dominated terrains (i.e., areas overlying the Middle Devonian Hamilton Group and similar stratigraphic units). The report suggests inhalation of radon in poorly-ventilated residences is a far greater threat than ingestion of drinking water. The NRC estimates that of the 160,000 Americans who die annually from lung cancer, approximately 19,000 (8.4%) developed lung cancer from a combination of smoking and exposure to gaseous radon. An estimated 160 deaths (0.01%) are attributable solely to inhalation of radon gas emitted from agitated residential groundwater (i.e., taking a shower, spraying the lawn, etc). Copies of the report are available (for sale) from the National Academy Press at (800) 624-6242.

So-called Synthetic Organic Compounds?

Research recently published in the journal *Environmental Science and Technology* (Vol. 32, No. 23, pp. 3724-3729) indicates that chloroform and possibly other trihalomethane compounds (i.e., bromodichloromethane, bromoform, etc.) occur naturally in soil. Apparently, hydrogen peroxide in the presence of hydrogen and chlorine ions forms hypochlorous acid (HOCl), which subsequently reacts with humic material to produce chloroform and various chlorinated humic compounds. This research may have important implications for natural attenuation-based remediation projects involving the use of hydrogen peroxide in soil with high organic matter content. Additionally, trihalomethane

compounds are commonly-detected disinfection byproducts in municipal drinking water systems which are also being investigated with increasing concern regarding possible carcinogenic properties.

Global Mining Developments

A recent survey of 279 companies involved in exploration for mineral resources indicated a total mining exploration budget in 1997 was \$4.03 billion (*Geotimes*, Vol. 43, No. 9). Exploration for gold continues to dominate with 65% of the budget, followed by the base metals copper, lead, and zinc (27%), diamonds (6%), and other metals (2%). Exploration in the U.S. and Canada accounted for 19.9% of the total budget (approximately \$802 million). Recent significant discoveries that are near or entering production include:

- The Batu Hijau porphyritic copper-gold deposit in Indonesia with reserves of 12 million ounces of gold and 10.6 billion pounds of copper;
- The Hartley Platinum deposit on Zimbabwe's Great Dike with an estimated annual production of 150,000 ounces of platinum and 110,000 ounces of palladium;
- The Ekati diamond deposit in Canada's Northwest Territories with an expected production of 3 to 4 million carats annually with 30% of the diamonds expected to be gem quality;
- The 45-million ton Cannington lead-zinc-silver deposit in Queensland, Australia grading 11.1 % lead, 4.4% zinc, and 16 ounces per ton silver;
- The Turquoise Ridge gold deposit in Nevada with estimated reserves of 4 million ounces; and
- The El Penon gold deposit in northern Chile with estimated reserves of over 1 million ounces.

Well Points to Ponder – No Doubt, a Deep Subject

How many of you have had the opportunity to model an aquifer and, based on the aquifer characteristics, design an extraction well? Did the well yield match your expectations? Did the size of your capture zone mimic your calculations? What about well spacing? Did the well(s) provide hydraulic capture on your site? If not, why not? Well, CNYAPG might just have some answers for you! Come to the March meeting and learn about where the theoretical and practical collide when it comes to well design, installation, and development.

For instance, did you ever consider...

In the water well industry, well yields represent the degree to which the success of a project is judged. Therefore, wouldn't it make sense that, when planning an extraction well(s) project on a hazardous waste site, one would mimic the approaches used on a water supply project?

Why are 10 or 20 slot screens installed in bedrock wells? Why are sand packs installed around a screen in a bedrock well? Why not develop bedrock wells prior to installing the sand pack and seal, thereby reducing development time and dramatically increasing efficiency?

Did your slug test results ever give you fits? How many of us have advanced augers through sand and then into stiff clay and silt, backfilled the boring to the bottom of the sand unit, installed a well and then wondered why your slug test data does not match our estimate for sand? Did you ever wonder where the clay cuttings went while drilling? Maybe the extra thickness of the sand pack required by the agency to reduce turbidity wasn't really such a good idea. And, while on the subject, is it a sand pack?...a filter pack?...a gravel pack?...formation stabilizer? Why are sand packs installed anyway?

Is it in your client's best interest to develop a 4-inch extraction well with a bailer and a small-diameter pump? And, while we're thinking along these lines, why are extraction wells designed, drilled, and developed as if they were simply large-diameter monitoring wells?

Did you ever consider that slug-tested wells developed on Fridays often yield lower estimates than those developed earlier in the week? And why is it that, so often, the water table contour map seems to have the groundwater flowing towards the last well installed?

These questions, and more, will be addressed when Bill Morrow takes the podium for the March meeting for CNYAPG.

What Next?

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You've Read the Book, You've Lived the Reality, and now... Disney Brings You the Movie!

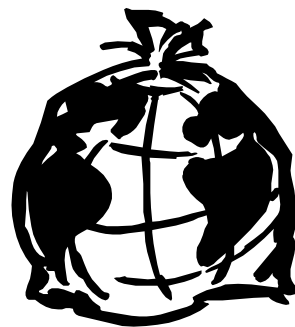
The Touchstone Pictures movie version of Jonathan Harr's *A Civil Action* opens on Christmas Day, bringing the issues of our everyday business into a courtroom drama for the big screen. Perhaps you took your vacation time to read the book and stay immersed in the nature of your business; now you can see John Travolta play an ambitious and flamboyant attorney taking on the big guys, first to promote himself, then to fight the good fight for the townspeople of a small Massachusetts town, who are recognizing a high frequency of leukemia due to pollution of their drinking water. In the end, the attorney fights the case because it is justice he desires. Or so the pre-release reviews

are saying.

The book was a dramatized telling of a real-life case that took nearly a decade of courtroom battles by personal injury attorney Jan Schlichtmann against W.R. Grace and the Beatrice Corporation on behalf of the townspeople of Woburn, Massachusetts. The movie will show his battle and the results, both personally and with relation to the case.

The movie features not only John Travolta, but Robert Duvall, Kathleen Quinlan, John Lithgow, Kathy Bates, William Macy, and a host of other familiar faces. It was directed by Stephen Zaillian, known for his movie, *Searching for Bobby Fischer*. The film was produced by Robert Redford and Scott Rubin.

A little touch of drama, a bit of what we, as consultants, take as everyday realities. But if your friends and family don't know what it is you do all day (and half the night, and weekends!), this is a chance to clue them in.



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March 21 - 25, 1999

Contaminated Site Remediation Conference, "Challenges Posed by Urban & Industrial Contaminants," Fremantle, Western Australia; organized by the Centre for Groundwater Studies. When you can only attend one conference per year, go for it! For more information about it, find their Web site <http://www.clw.csiro.au/CGS/conferences> or call **+61-8-9257-2088**.

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Directions to the Marriott at Carrier Circle



January CNYAPG & ASCE Joint Meeting: Offering a private-party cash bar starting at **6:00 PM through 7:30**. Dinner starts at **6:30 PM**, and includes several salads, chicken Marsala with brown mushroom gravy, pasta Primavera, veggies, potatoes, etc. Our speaker will take the podium at **7:30 PM**. The cost is \$22 in advance, **\$24** at the door, and **\$18** for students. We need reservations early to help with planning. **Please call Buck Gabriel at (315) 437-6100, ext. 2656, by January 8th.**

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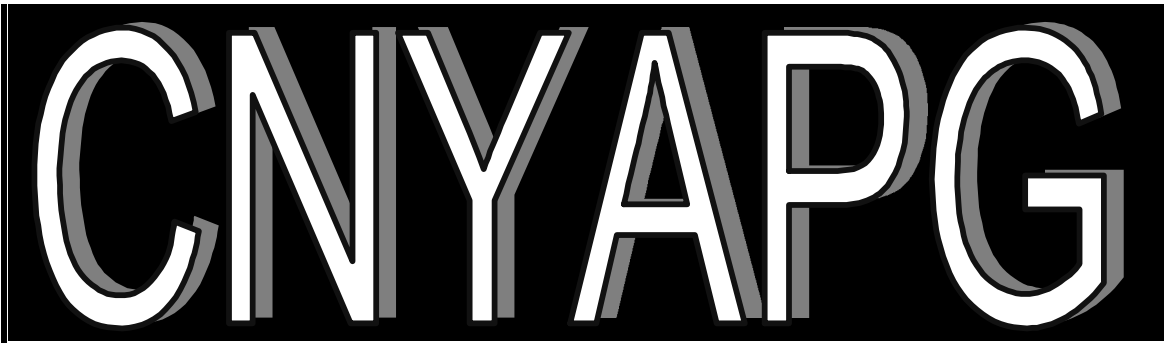
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February CNYAPG/ASCE Joint Meeting: A Three-Phase Approach

Phase 1: Student Poster Session: CNYAPG/ASCE members will be joined during the dinner hour by college and high school students as they display and discuss their current science and engineering research projects. Students and professionals will benefit from the interaction. Poster displays will range from thesis research topics to science fair projects.

Phase 2: Dr. William Kelly, President of the New York State Council of Professional Geologists will present an overview of the organization's efforts to achieve professional licensure for geologists in New York State.

Phase 3: Kevin M. Bernstein, Esq., presents ***How Attorneys and Consultants Can Work Together Productively - Within or Outside the Court Room***

Just as being a practicing attorney is not usually taught in law school, being a consultant or expert witness is not usually taught as part of a consultant's professional training (whether the consultant is a geologist or engineer). Unfortunately for consultants, working with attorneys is a fact of life. Whether there are environmental legal issues involved or a matter is headed to court, attorneys always seem to be involved. However, this fact, unfortunate or not, can still result in a productive team working environment, as long as each professional knows the boundaries of their expertise.

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We will convene on Thursday, February 11 at 5:30 PM, back at the Glen Loch in Jamesville for a joint meeting with the ASCE. It will be a full evening you won't want to miss! We look forward to seeing you then!



PRESIDENT'S PAGE

Regarding last month's cancellation:

Once again we had to make a hard decision concerning cancellation. Luckily, the CNYAPG and ASCE Board members were in agreement on the weather cancellation issue! I know my feelings are shared by other geologists and, likely, engineers as well (lawyers, maybe?): We should not be stopped by weather conditions. Yet, common sense prevailed with the heavy winds and snow, and we canceled. Thank you to all who helped spread the word. Gerry Gould will always post updates and cancellations on the CNYAPG web site. Apologies go out to the few (two) who did show up last month. I would venture to bet on their discipline!

This situation does bring up a good point. CNYAPG could further benefit you by having updated telephone and e-mail addresses on file. As you *renew your membership* this month, be sure to include this information on the renewal form, or provide it to Gerry Gould by visiting our Web site or calling it in directly. Additionally, leave your name and number when making reservations in advance with Buck Gabriel.

We had an excellent pre-registration for the January meeting. We hope you all return this month. Kevin Bernstein agreed to reschedule and, from talking with him, his presentation promises to be interesting to all disciplines. This month will be a full evening and we anticipate that it will be a bit different and fun.

Professional mentoring and tithing: Part of CNYAPG's intention for including a Student Poster Session in the meeting agenda is to recognize the importance of professional mentoring. I also like to include the word tithing in the sense of giving back from one's professional prosperity and gain for the good of the organization/group/profession. Giving of your professional prosperity does not necessarily mean financial donations, although most organizations and students would welcome such gifts. Consider volunteer time such as

participation in CNYAPG, judging local science fairs, talking to students at all levels, to name a few, as professional tithing and on the right path to mentoring. As professionals, consider the options available to give of your time to students, younger colleagues, and organizations like CNYAPG.

Mentoring has become a corporate buzz word in an attempt to make young professionals feel incorporated. However, stories suggest that many programs can fall short of actually achieving this intent; however, they do provide circumstance for a Dilbert cartoon. I wonder why the corporate arena has a more difficult time actually achieving mentoring. Consider the meaning of the word mentor, "a wise and trusted counselor or teacher."

There are good reasons why individuals should consider looking beyond their current work establishment for a mentor. It is rewarding to find another individual with more professionally-related experiences to assist us in making personal decisions during professional changes and challenges. A mentor should be someone capable of listening, helping you identify your goals and how to achieve them, willing to give of their time and experiences, not bound in opinion by personal agendas, or corporate philosophy and rhetoric, and has your best interest in mind.

Obviously, a mentor need not necessarily be an elder. Often close friends or colleagues can provide the perspective you need. A mentor, in my opinion, is someone who not only provides advancement on a technical level, although professionally this is important and necessary. We all continue to need individuals, organizations, short-courses, and continued education venues to maintain technical proficiency. Mentoring and tithing should go beyond merely the transfer of technical experiences.

I remember my first opportunity to provide professional tithing to a group of Boy Scouts involved in a collect-and-identify-rocks project. I was a graduate student, requiring my own mentoring, yet to

these kids, I was real geologist. I struggled to identify weathered remnants of pebbles glued to the inside of a dresser drawer. The key was not to be concerned about being correct in the identification. I was not there as a technical resource alone; I was there to exhibit excitement about the process of learning. To invoke interest and participation makes for a greater contribution to all involved. Don't take my word for it, try it yourself in your community! **Join CNYAPG on February 11, 1999 as we talk with students during the pre-dinner Poster Session.**

Join together for talk and entertainment to help ease the passage through the quantitatively shortest, yet mentally longest, month of the year.

Vita DeMarchi P.G.
CNYAPG President

E-Mails from the Membership

A true story from the halls of a local consulting firm, upon receiving notice of the cancellation of the December CNYAPG/ASCE dinner meeting:

Vita,

I kidded Matt Millias (ASCE member) that it must have been engineers who canceled out; the geologists wouldn't let a little weather stop them. However, in the interests of geologist-engineer cooperation (and technical evaluation of the data), we finally decided to blame it on the lawyer.

Looking forward to the next meeting.

Regards,
Steve Rossello

Apologies Are in Order!

In our rush to get the newsletter to the printer before the holidays, we neglected to credit Bill Morrow of Parratt-Wolff for his contribution. When you see Bill at the next meeting, please let him know you enjoyed his item and that you look forward to his presentation in March. Sorry, Bill! It won't happen again...

GEOLOGIC NEWS

In the Know...

with Jon S. Fox

Natural "Greenhouse Effect?!"

Recent paleoclimatic research (*GSA Bulletin*, v. 111, pp. 52-70) presents additional evidence from paleosols in the Sydney basin (Australia), which suggests that the paleoclimate after the extensive *mass extinction at the end of the Permian* showed pronounced warming (obviously having nothing to do with industrial air emissions). The Permian mass extinction is the most profound mass extinction in the geologic record. Recent published theories regarding potential causes of the Permian-Triassic mass extinction include oceanic anoxia, overturn of carbon-dioxide-enriched deep ocean water, massive flood basalt eruptions in Siberia, catastrophic methane release from oceanic and/or permafrost clathrates, and extraterrestrial impact(s). The paleosol data represent a terrestrial addition which apparently compliments previous research suggesting a relatively rapid increase in global temperature at the Permian-Triassic boundary. Previous data and interpretations are based predominantly on marine-derived data, including paleomagnetic, isotopic, radiometric dating, and paleontological data. However, additional research regarding atmospheric modeling is required to more adequately compare theories to observed atmospheric changes. An obvious implication of this research involves re-examination of the relative importance of anthropogenic contributions of carbon dioxide and other "greenhouse" gases relative to natural contributions of these gases. Additional research may suggest that humanity ultimately cannot regulate our physical world to our own pre-conceived notions of acceptable chemical and physical composition and property.

Don't Ignore the Minerals!

Iron and sulfate reduction may play a dominant role in microbial degradation of organic contaminants in the subsurface, particularly in anoxic subsurface environments. Current research published

in *Bioremediation Journal* (v.2, pp. 259-276) suggests adequate characterization of natural attenuation remediations involving iron and sulfate geochemistry should include analysis for iron and sulfur minerals rather than being limited to groundwater concentrations. However, such analyses are hindered by sampling considerations involving preservation of the ambient oxygen content in the subsurface zone of interest. The authors outline several techniques for sampling and analysis to preserve anoxic sample conditions and/or minimize oxygen contamination of samples. The proposed techniques may be cost-effective for medium- to large-scale natural attenuation projects. However, some extra sampling effort (apparently minimal) and a specialized arrangement with a competent environmental laboratory probably would be required to obtain reproducible, valid analytical results.

PAH from Coal or Crude Oil?

Geochemical and geological investigation of marine sediments in the Gulf of Alaska and Prince William Sound suggests many areas of polycyclic aromatic hydrocarbons (PAH) represent naturally-occurring background concentrations derived from coal particles naturally present in the sediment, not from crude oil-derived PAH from the contamination event popularly known as the Exxon Valdez (*Environmental Science and Technology*, v. 33, pp. 34-42). The authors collected and analyzed samples of marine sediment, coal from local outcrops, unweathered crude oil, and local pelagic and benthic organisms. Analytical results suggest the geochemical PAH signature of coal is distinguishable from crude-oil derived PAH. Analysis of salmon and mussels for PAH revealed that the coal PAH is not bioavailable, whereas the petroleum-derived PAH is bioavailable. These results have implications for remediation of petroleum releases at coastal sites where local geology or anthropogenic activity (i.e., coal-burning plants) suggests coal clasts are a constituent of the affected sediments.

Recent Earthquakes in New York State

Seismic data from the Lamont Cooperative Seismic Network (LCSN) operated by Lamont-Doherty Earth Observatory is available over the Internet. A review of recent data from LCSN revealed the following earthquakes were identified in northern New York State.

Date	New York Location	Depth (km)	Magnitude (Mc)
7/31/97	52.3 km SE of Watertown	5.4	3.0
10/12/97	21.0 km W of Malone	14.0	2.9
10/13/97	30.7 km SE of Canton	4.2	3.0
10/20/97	21.1 km of Malone	13.3	1.5
6/9/98	21.9 km W of Plattsburgh	5.0	2.9
7/9/98	18.2 km W of Plattsburgh	0.0	2.5
7/24/98	24.1 km of Malone	4.5	2.2
12/5/98	21.7 km S of Canton	0.1	1.7
12/5/98	41.6 km S of Saranac Lake	5.0	2.0
12/25/98	53.5 km N of Brockport	9.6	3.0
1/5/99	21.5 km of Malone	6.0	2.3
1/5/99	22.2 km W of Malone	7.0	2.0

Review of epicenter depths of northern New York earthquakes reveals the vast majority of the earthquakes are centered well into the Precambrian basement (shallow to moderate depths into the continental crust). The most active area recently is the vicinity approximately 21-22 kilometers west of Malone. This area is located in northwestern Franklin county immediately north of the hamlets of Brushton and Moira on United States Highway 11.

Reminder - Membership Renewals Due

CNYAPG renewal forms were provided in the November 1998 newsletter. Renewals are still a low, low \$20 per year! All CNYAPG memberships expired in December. If you need a form, you can download it from our Web site: www.dreamscape.com/cnyapg or call Gerry Gould (CNYAPG Secretary) at 437-1142. Don't miss out on any of the benefits of your membership. Renew today!

Cool News from the Internet

From the Association for Women Geoscientists News: www.awg.org

Request for Outstanding Photos from children's Book Project: Most geologists understand the aesthetic qualities of rock. A children's *Art of Rocks* Book Project has been designed by photojournalist Lou Jacobs, Jr., a writer of over 40 books on photography and numerous children's books. The *Art of Rocks* Book Project is designed for 8 to 12 year old children, to interest them in science, in the aesthetics of geology, as well as the important lesson of seeing the art in rocks. The planned book will contain numerous color and black and white photos combined with limited text about the interesting features or special history of the photo.

The *Art of Rocks* Book Project is requesting those with appropriate photos to submit them for the upcoming book. Submitters of photos selected for publication will receive a free copy of the book and a listing in the photo credits. Rules of submission: Please send color slides or 4" x 6" prints to James A. Jacobs, Art of Rocks Book Project, 707 View Point Road, Mill Valley, CA 94941; work phone (510) 232-2728, ext. 222; e-mail: augerpro@jps.net. The photos are requested by February 15, 1999. In addition to the photos, please submit a brief discussion of the subject matter and a few sentences about how the photo came to be taken and a little about the photographer.

American Geological Institute Seeks Summer and Semester Interns: The American Geological Institute is accepting applications for both semester and summer internships with the

Government Affairs Program. The internships are open to both undergraduate and graduate geoscience students with an interest in federal science policy. Activities include:

- Monitoring and analyzing geoscience and environmental legislation in congress.
- Updating legislative and policy information on AGI's World Wide Web site.
- Attending House and Senate hearings and preparing summaries.

The summer internship lasts 12 weeks and carries a \$3,000 stipend. The fall semester internship lasts 14 weeks and carries a \$3,500 stipend. The application deadline for both internships is March 1. For details on how to apply and more information on the internships, visit the AGI Web site at <http://www.agiweb.org/gapac/intern.html> or e-mail govt@agiweb.org.



PhytoWorks Update from Michael Coia

PhytoWorks and Doe's Brookhaven National Laboratories to Sign \$1.5 Million Agreement to Develop Heavy Metal and Radionuclide Phytoremediation Solutions: On January 22nd, PhytoWorks, Inc. announced that the US Department of Energy (DOE) has approved a Cooperative Research and Development Agreement between PhytoWorks and Brookhaven National Laboratories (BNL) in the amount of \$1.5 million. PhytoWorks and BNL will analyze the ability of PhytoWorks' genetically-engineered plants, already proven to take up mercury, to cost-effectively remediate radionuclides and other heavy metals.

Radionuclide and heavy metal contamination account for a significant portion of the remaining \$147 billion in projected cleanup costs at DOE installations. 90% of DOE sites have radionuclide contamination and 55% are contaminated with heavy metals. "Phytoremediation" solutions, which use

plants to take up and store these contaminants for recovery, are expected to reduce cleanup costs by 60% to 90% versus conventional remediation methods. This could save the DOE and taxpayers billions of dollars.

We congratulate our December speaker, Mike Coia, and PhytoWorks for this tremendous opportunity.



You are Still Needed!

Do you have any ideas for a CNYAPG sponsored Spring Field Trip or Seminar? Let us know at www.dreamscape.com/cnyapg.

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarchi@secor.com.

* CONTRIBUTIONS TO THIS MONTH'S

CNYAPG NEWSLETTER

WERE MADE BY:

Vita DeMarchi Jon. S. Fox

Gerry Gould

Nancy Gensky Georgia Popoff

Thursday, February 11, 1999

CNYAPG and ASCE join to welcome Kevin Bernstein, Esq., with Bond, Schoeneck & King, to discuss the professional working relationship between geologists, engineers, and attorneys. Dr. Bill Kelly, president of the New York State Council of Professional Geologists (NYSCPG) will give an overview of professional geologist licensing status. See meeting details below. Additionally, regional college and high school students will display their research posters during the pre-dinner hour. Join us early to meet and talk with students.

Friday, March 5, 1999

Professional Seminar: A Review of Geology for the Practicing Geologist and the Pennsylvania Professional Geologist Examination. A unique professional review course covering both the fundamentals and practice of geology. Presented by the Pennsylvania Council of Professional Geologists (PCPG) to serve the professional interests of geologists. Contact: PA PCPG, PG Review Course, 717 North Second Street, Suite 300; Harrisburg, PA 17102-3211; (717) 238-1222.

Thursday, March 11, 1999

CNYAPG will host a series of short technical presentations. The prospective agenda includes "Practical Considerations for Well Design, Installation, and Development," by Bill Morrow of Parratt-Wolff, Inc., and a new method in PCB, dioxin, and PAH screening techniques by Columbia Analytical Services, Inc.

March 22 - 24, 1999

Northeastern Section GSA Meeting, in Providence, Rhode Island. Contact O. Don Hermes, Department of Geology, University of Rhode Island; (410) 847-2192; e-mail: dhermes@uriacc.uri.edu. Call by February 12th for the pre-registration fee.

Thursday, April 8, 1999

Members of CNYAPG have voiced an interest in an update on **Onondaga Lake**. We are coordinating speakers to accommodate this request. Tentatively, the evening will include a viewing of a slide show produced by Atlantic States Legal Foundation to generate new excitement about the lake's future and trace the history that created one of the most polluted bodies of water in the U.S.

April 15 & 16, 1999

Unified Watershed Assessment: Where Do We Go From Here? The American Water Resource Association Mid-Atlantic Conference to be held in Matamoras, PA. Unified watershed assessments, restoration priorities, and strategies are cornerstones to the Clean Water Action Plan, an initiative designed to support continued progress toward clean water across the nation. Join a multi-disciplinary group to reflect on key questions. For info, contact: Glenn Maurer at (717) 787-2666, or e-mail him at maurer.glenn@a1.dep.state.pa.us.

May 1999

CNYAPG Walking Tour with Mr. Bob Preyer of the MOST. Tour downtown Syracuse, reflecting on the geologic origins of local building materials and stone work. The tour will conclude with dinner and end-of-year party at a downtown pub location.

Directions to the Glen Loch



February CNYAPG & ASCE Joint Meeting: Back to the rustic setting at the Glen Loch. Pre-dinner hour features munchies and cash bar during the Student Poster Session, beginning at **5:30 PM**. Dinner will start by **7:00 PM**. Our guest speakers will take the podium at **8:00 PM**. The cost is \$15 when reserved at least 24 hours in advance and \$17 that evening. Students with IDs enter for \$10. *Help us plan; reserve early* Contact *Buck Gabriel at (315) 437-6100, ext. 2656.*

**CUT & PASTE
MAP HERE**

The Board Members would like to thank all of the corporate and individual supporters of CNYAPG throughout the past year. We would like to encourage you to continue your pledge of support throughout the upcoming year. Contact Steve Crook at (315) 437-1429 or (518) 827-5720 details.

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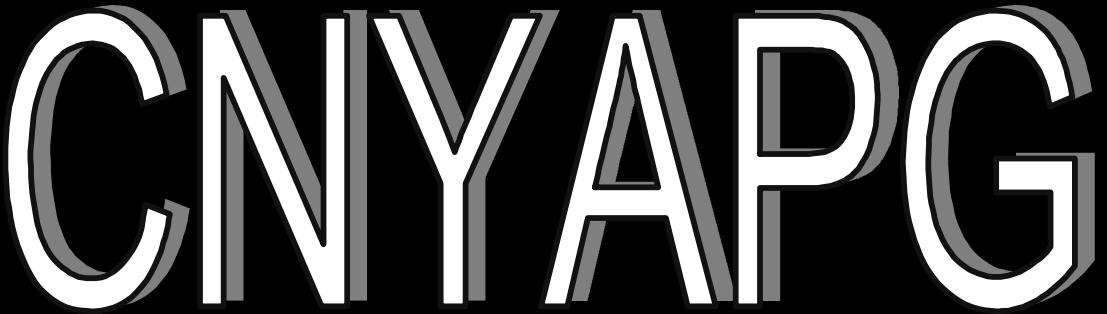
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**CNYAPG
PO Box 567
Dewitt, NY 13214**

CNYAPG MISSION STATEMENT

The CNYAPG was founded in 1993 to strengthen and advance the geologic sciences as a profession and to provide an open forum for the exchange of ideas; to promote the protection of public welfare through the professional practice of geologic sciences; to inspire and maintain the highest standards of professional conduct, business ethics, and personal honor of the membership; to foster the spirit of scientific research throughout the membership; to publish and otherwise disseminate information related to the geologic sciences and associated technologies; to maintain and encourage intra- and inter-association activities, to enhance the association's programs, and to encourage the affiliation of individual members with other scientific and technical organizations.





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We will convene on Thursday, March 11 at 5:30 PM, at the Glen Loch Restaurant, 4626 North Street, Jamesville, NY (315-469-6969). Dinner starts at 6:15 PM. It will be a another full evening's program that you won't want to miss! We look forward to seeing you then!

Practical Considerations for Well Design, Installation, and Development

Mr. William Morrow, PG/CWD, of Parratt-Wolff, Inc. (East Syracuse, NY and Hillsborough, NC) will be our first presenter for the March CNYAPG meeting. As more and more site investigations have evolved into remedial design, small diameter monitoring wells are being replaced with remediation wells. These wells are typically larger in diameter, more costly to install and need to be located at precise locations and depths; thus, they are also expected to perform to a pre-determined efficiency, or to yield a specific capture zone or zone of influence. These wells may be used to extract water or they may be used to inject air or water into the subsurface. All in all, these wells have a very different function than the typical monitoring well.

However, given their difference in function, why is it that remedial wells are so often installed as if they were simply big monitoring wells.

Many of you have had (or will have) the opportunity to model an aquifer and, based on the aquifer characteristics, design remediation wells. Did the well yield match your expectations? Did the size of the zone of influence mimic your calculations? What about well spacing? Did the well(s) provide hydraulic capture on your site? During 29 years of experience, Parratt-Wolff has repeatedly seen successful remedial designs sabotaged by poor well design, installation, and development.

Mr. Morrow will use his 14 years of drilling and consulting experience to present simple, practical tips on designing, installing, and developing remediation wells, gleaned from successful projects, as well as a few we'd rather forget! With a focus on both rock and overburden wells, along with screened and unscreened completions, and using personal case studies, referenced literature, and an occasional opinion, Mr. Morrow promises an entertaining program, concluding with a roundtable discussion of your personal observations. Please join us and come ready to share your anecdotes!

Screening with Columbia Analytical's P450 RGS Biomarker

Dr. Jack Anderson, of Columbia Analytical Services, Inc. (Rochester, NY) will discuss development and application of Columbia's proprietary screening technique for dioxins, furans, coplaner PCBs and PAHs using the human liver cancer cell line (101L), developed by researchers at the University of California, San Diego. Because the human CYP1A1 gene is fused with the luciferase gene of a firefly, a toxic compound initiates the production of the luminescent enzyme, luciferase. Luciferase production provides an easy mechanism to measure the amount of CYP1A1 induction, an indication of the amount of carcinogen present in the extract of a sample. Environmental samples are extracted following standard SW-846 protocols using methylene chloride. Relative light units measured by a luminometer are compared to standard curves for known concentrations of either benzo(a)pyrene (B[a]P) or a standard mixture of dioxins/furans, and the data are reported as benzo(a)pyrene and/or dioxin (TEQ) equivalents.

Correlation coefficients (r squared values) for the relationship between mg/kg of B[a]P equivalents and high molecular weight PAHs have been between 0.7 and 0.9. The relationship between TEQs measured by USEPA 8290 and the RGS assay has also been very strong (r squared = 0.78-0.99).

The P450 RGS Biomarker has been accepted as SM 8070 and ASTM E 1853-1996 and is pending approval with the USEPA (draft SW Method 4425). Various state agencies, as well as the U.S. Air Force, USEPA, Army Corps of Engineers, and NOAA have approved the P450 RGS as a screening tool for specific projects. Learn more and ask questions about it at the March meeting!



PRESIDENT'S PAGE

After last month's topic of becoming involved professionally as a volunteer and mentor, I accepted two additional volunteer activities, including a new appointment as Director to the NYSCPG and as a technical advisor for a high school student developing a long term research project in phytoremediation. Although these opportunities are welcomed and rewarding, I cannot forget the issue of maintaining balance in life among career, professional growth, family, and personal time to just smell the herbs and dig through rock beds.

We are constantly faced with choices. Many professionals I know, including myself, have difficulty saying No to new professional opportunities, regardless of the time commitment. Knowing one's limits is an admirable trait worthy of respect. It can be disconcerting for all concerned when someone commits to be involved and then never makes the time. It seemed that the subject of time commitments and balance were issues for several professionals I spoke with this month. Particularly when it came to the subject of my call: volunteering for nomination to next seasons CNYAPG's Board of Directors.

CNYAPG is asking all members with some time and interest in maintaining and advancing the CNYAPG organization to consider a nomination as Director for the 1999/2000 season. What do Directors do? The CNYAPG By-Laws, Article 2, Section 9, indicates that a Director serve a two year elected term and shall function in a judicial and advisory capacity to the Officers. They shall perform all such other duties as are properly required of them by the Executive Board. What the responsibilities actually include, in reality, vary based on the individual. It can include ensuring the projector is functioning for the speaker each month, assisting with dinner collections at the door, helping coordinate special events like seminars and

field trips, and simply providing voting and idea support to the Officers. The point being, the position can be what You want to make it. Your volunteer contribution is welcomed and appreciated by all members of CNYAPG.

Just a few words on what CNYAPG involvement has meant and done for me professionally and personally. I have the opportunity to meet geologist working in a variety of professional arenas, providing me with a refreshing perspective, as my career has been focused in environmental consulting. Additionally, I have the opportunity to talk with other geologist working in consulting to gain a broadened perspective of the color of the grass on the other side of the fence (Note: it appears to all be varied shades of green). Often we tend to limit our associations to fellow geologists in our own work environment. I've been given the opportunity to present myself in a unbiased position, as a Director and Officer of CNYAPG, as opposed to my professional career title and firm name, which I've noticed has allowed for a "freer" exchange of ideas and conversations regarding geology in general. I discovered that most geologists share a similar passion for the science that goes beyond their job title. It has been this experience that has connected me back to the basic excitement of being a geologist.

Organizations like CNYAPG work to provide a venue for personal and professional exchange of ideas and foster the spirit of the geologic sciences. We hope to maintain a varied group on the board, representing geologists involved in career and research paths in the private and academic sectors.

CNYAPG is now ACCEPTING NOMINATIONS for DIRECTORS. Feel free to contact me and other members of the CNYAPG Board to discuss your potential role. I take it as a good sign that existing Directors are willing to step up their commitment and become Officers in the coming season.

Looking forward to seeing you at the next meeting

Vita DeMarchi, P.G.

E-Mail/FAX News from the Membership

Adjunct Instructors: Physical Sciences, Onondaga Community College. The Physical Sciences Department invites applications to increase the pool of adjunct professors for possible openings beginning August 1999. Teaching assignments include lecture and laboratory instruction in meteorology and/or astronomy. Geologists are encouraged to apply.

Minimum Requirements: Bachelors required, Masters preferred, in Earth Science or closely related field. Teaching experience or relevant work experience required. Must be available for day or evening assignments. **Salary:** \$833 per semester credit hour. **Application Deadline:** Review begins March 8, 1999 and continues until assignments are made. Send current resume; cover letter of application; names, addresses, and phone numbers of 3 references to: Office of Human Resources, Room 114 Service and Maintenance Building, Onondaga Community College, 4941 Onondaga Road, Syracuse, NY 13215-2099 (Attention: Physical Sciences Search).

For other job postings and opportunities, take a look at the Web site for the Association of Women Geoscientists News: <http://www.awg.org>. They have several very intriguing postings listed.

GEOLOGIC NEWS

In the Know...

with Jon S. Fox

To Report or Not Report?

The New York State Department of Environmental Conservation (NYSDEC) filed a complaint in May 1998 against an environmental consulting firm and one of its officers (Respondents) for allegedly failing to report petroleum contamination to NYSDEC within the 2-hour reporting limit required by 6 NYCRR Section 613.8. The incident in question involves installation of soil borings by a different consultant around a 3,000-gallon underground storage tank formerly located in Deer Park, New York. NYSDEC Region 1 staff are seeking imposition of a \$25,000.00 civil penalty against Respondents, jointly and severally, for violation of the reporting requirement. Respondents filed a motion requesting dismissal of the complaint essentially based on the defense that "any person" as defined in 6 NYCRR Section 613.8 is restricted to facility owners and operators, and that Respondents were not owners or operators of the facility. An administrative law judge (ALJ) agreed with the Respondent's position and dismissed the complaint in October 1998. NYSDEC staff appealed the ruling of the ALJ to the NYSDEC Commissioner. The Commissioner, citing a broad interpretation of the definition of "any person" listed in 6 NYCRR Section 613.8, rejected the ALJ's ruling and referred the matter for further action in a ruling on appeal dated December 31, 1998. The Commissioner also indicated that possible protections to Respondents which may be granted to professional engineers (Code of Ethics) and/or attorneys (attorney-client privilege) do not apply in this action. Additional information regarding this enforcement action is available over the Internet at <http://www.dec.state.ny.us/website/ohms/decis/middlecr.htm>.

Burgess Shale Revisited

A recent review by Peter Bowler (*American Scientist*, Vol. 86, No. 5, pp. 472-475) highlights a new book by Simon Conway Morris entitled "The Crucible of Creation: The Burgess Shale and the Rise of Animals" (1998, Oxford University Press). Conway brings to light the interesting interpretative conflict regarding the seemingly bizarre fauna contained in this classic Cambrian fossil location in the Canadian Rockies.

The Burgess Shale fauna was first described by Charles Doolittle Walcott, who grouped the apparently large variety of fauna into a few phyla, mostly arthropods. More recently, paleontologist Stephen Jay Gould proposed a markedly different interpretation highlighting and embracing the morphological variety observed in the formation. Gould suggested that Walcott's narrow grouping of the Cambrian Burgess Shale fauna was due to the prevailing view that faunal diversity should expand through time and so, paid too little attention to the apparent morphological diversity expressed in the fossils. Morris, citing other interpretations of the Burgess Shale fauna and recent discoveries from similar deposits in Greenland and China, apparently demonstrates that the diversity of forms in the Burgess Shale fauna is not as extensive as proposed by Gould. The central theme of Morris' book appears to be conflict between current schools of paleontological thought on the importance (or unimportance) of evolutionary convergence and, ultimately, the uniqueness (or commonality) of evolutionary processes on this planet.

Martian Geology Crude Oil?

A recent manuscript published in *American Scientist* (Vol. 87, No. 1, pp. 36-45) provides interesting results regarding geological evaluation of photographic and chemical data derived from the recent Mars Pathfinder mission. The landing site for Pathfinder was placed near the confluence of two large valleys which display erosional landforms very similar to landforms on Earth created by water (fluvial) action, in the hope that different rocks of various textures and compositions would be present due to erosion of the surrounding terrain by the apparently huge floods which modified the area. Currently, Martian stratigraphy is divided into three geologic periods (Noachian, Hesperian, and Amazonian), which are defined by concentrations of craters. Many astrogeologists believe the concentration of craters is correlatable with absolute age, with the oldest period (Noachian) having the highest concentration of craters per square area. Unfortunately, the resolution of photographs generated from the mission is insufficient to allow identification of individual mineral grains, making textural interpretations (and, therefore, classifications) difficult and ambiguous.

However, the resolution of the photographic data is sufficient to allow identification of pits in many of the rocks, suggesting possible volcanic origin (possible vesicles). Additionally, flute-like structures have been observed in many rocks with

the same directional orientation, suggesting erosive modification of the rocks by wind-blown particles. Linear features have been observed on some rocks which may represent bedding (sedimentary rock), banding (metamorphic rock), or fracturing (any rock!).

Previous data suggested that surficial Martian mineralogy is dominated by iron oxides. In addition to providing visible and ultraviolet light imaging data, the Pathfinder imager was also used to collect spectral data from sunlight reflected off rocks in an attempt to identify certain minerals. Curiously, the spectral data was unable to confirm the presence of pyroxenes, thought by many astrogeologists as probably being prevalent in Martian rocks. The authors suggest the absence of a pyroxene absorption band within the wavelength range determinable by the Pathfinder imager may be due to: 1) the rocks are glass-like; 2) opaque minerals are obstructing the pyroxene absorption band; and/or 3) the location of the absorption band has been shifted outside the range detectable by the Pathfinder imager due to an unusually-high iron and/or calcium concentration of Martian pyroxene. Curiously, a fourth possibility (namely, that pyroxene is not present in the rocks) was not mentioned. Spectral examination of dust which coats many rocks suggests the presence of the ferric iron oxides maghemite ($\gamma\text{-Fe}_2\text{O}_3$) and ferrihydrite ($5\text{Fe}_2\text{O}_3 \cdot 9\text{H}_2\text{O}$).

Chemical analyses of rocks encountered at the site suggest the mineralogical composition of rocks least affected by dust is comparable to andesite. This surprised many astrogeologists, who expected a basaltic composition based on that of suspected Martian meteorites identified on Earth. Additionally, all of the rocks analyzed at the site had nearly identical chemical composition, suggesting they are all of similar lithology. It should be noted, however, that only larger rocks at the landing site were analyzed due to difficulties in positioning the x-ray analytical device. All of the six Martian soil samples were rich in iron oxides and sulfur.

Confirmation of the P450 Reporter Gene System Results by the Atlanta, GA USEPA

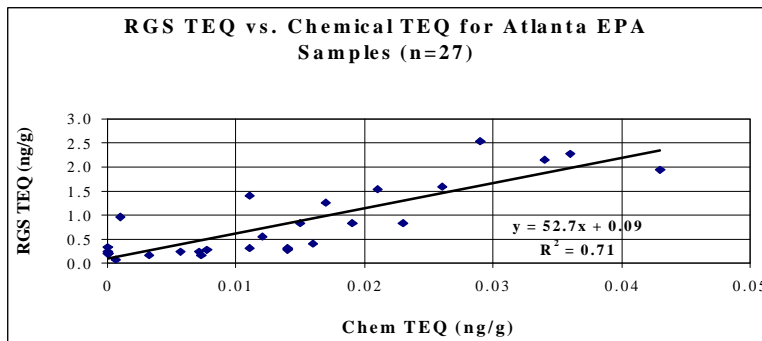
Dioxins, furans, coplanar PCBs, and some high molecular weight PAHs are known to bind to the Ah receptor (AhR) and subsequently mediate induction of the CYP1A gene, resulting in the production of cytochrome P4501A. This biochemical event is widely used as an indicator of exposure to potentially harmful contaminants. Using a transgenic human cell line (101L), the P450 Reporter Gene System (RGS) can detect the presence of CYP1A1-inducing compounds in solvent extracts of environmental samples, such as sediment, soil, and tissue. When contaminants are present, luciferase is produced by these cells, from a stably integrated plasmid containing the firefly luciferase gene linked to human CYP1A1 promoter sequences

Samples were submitted to the Kelso, WA laboratory of Columbia Analytical Services (CAS) for extraction, and these extracts were then tested at the Vista, CA lab of CAS. After completion of testing with the RGS assay (Standard Method 8070, and ASTM Standard Guide E1853), the data were submitted to EPA. The EPA office then provided the data to CAS from the High Resolution MS analyses (Method 8290) of the same samples. The figure below illustrates the comparison between the two methods that vary in cost by approximately an order of magnitude (RGS -\$150). In this investigation, as well as several other confirmation tests, the correlation coefficient was quite good, and the samples were ranked from low to high in agreement with the more expensive and time consuming HRMS method.

Testing with the RGS assay has been conducted on over 500 sediment samples from the three coasts for NOAA, and dioxin investigations have been conducted for EPA, the Corps of Engineers, the Air Force, and their contractors. For more information, including several recent publications and published methods, contact Dr. Jack W. Anderson (E-mail: jaanderson@kelso.caslab.com).

Cool News from the Chicago Tribune

The American Geophysical Union (AGU) issued a policy statement that despite uncertainties, evidence indicates that the release of human-produced chemicals will change climates. The AGU joins the American Meteorological Society, which issued a similar policy in 1990. The policy statement did not include recommended actions but rather recommended the



development and consideration of ways to reduce emissions; the government would set specific actions in the future. Such actions are pending in the Clinton administration including the Kyoto protocol -- an international agreement specifying reductions in carbon emissions. Conversely, critics argue that the uncertainties in the evidence do not link the release of human-produced chemicals to changing climates, and the climatic changes observed are within normal variability. More information can be found on AGU's web page www.agu.org.

New Mexico- Mars Connection

Scientists from the NASA Ames Research Center and the University of New Mexico are studying microbes living in Spider Cave, New Mexico. Despite no sunlight, little water, and few nutrients, microbes live using the iron, manganese, and sulfur in the cave rocks. By studying these microbes as well as similar microbes in other harsh environments (e.g., polar ice, ocean bottoms, mountain tops), scientists can develop theories of life on Mars. The field portion of this study is not for the claustrophobic couch potato. To get to the cave, scientists must hike down into a canyon, descend into the cave in a tight "belly crawl" passage, then hike another 4 miles through a maze of passages. Then do it again in reverse. Fortunately, trails are marked in the cave system. And all in the name of science! Information on caving in New Mexico can be found at www.nps.gov/cave (*Chicago Tribune*).

Arsenic Poisoning

Naturally occurring arsenic is contaminating water supplies in Bangladesh. Prior to the 1970s, Bangladesh villages relied on surface waters for their drinking water, which became contaminated by fertilizers and sewage. As a result, starting in the 1970s, UNICEF and other United Nations agencies installed drinking water wells in Bangladesh villages. Subsequently, villagers installed more wells resulting in a total of approximately 4 million

wells and starting using the well water, not only for drinking purposes, but also for irrigation. The increase in irrigation wells, the additional population as well as dry seasons caused the water table to drop, exposing naturally occurring arsenic from Himalayan rock-derived sediments to oxygen resulting

in the formation of water-soluble forms of arsenic. When the water table rose as a result of the monsoon seasons, the water-soluble forms of arsenic were drawn from the wells.

A Belgian study has found arsenic not only in the water supply but also in leaves, stems, roots, and cattle feed and possibly in the entire food chain. Another survey conducted by the World Bank evaluated 10 percent of the 4 million Bangladesh wells; approximately 40 percent were contaminated with arsenic. A World Bank representative estimates that 18 to 24 million Bangladesh villagers have been exposed to the arsenic and possibly another 6 million Indians in the same valley. Approximately 45 million dollars from the World Bank, the Bangladesh government, and the Swiss government will be used to continue testing for arsenic. Obviously, more money will be required to find alternative water supplies and/or to treat the existing well waters to remove the arsenic (*Chicago Tribune*).

Do you have any ideas for a CNYAPG sponsored Spring Field Trip or Seminar? Let us know at www.dreamscape.com/cnyapg.

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarchi@secor.com.

* CONTRIBUTIONS TO THIS MONTH'S CNYAPG NEWSLETTER WERE MADE BY:

Vita DeMarchi Jon. S. Fox
Gerry Gould Meg Harris
Nancy Gensky Georgia Popoff

Friday, March 5, 1999

Professional Seminar: A Review of Geology for the Practicing Geologist and the Pennsylvania Professional Geologist Examination. Presented by Pennsylvania Council of Professional Geologists (PCPG) to serve the professional interests of geologists. Contact: PA PCPG, PG Review Course, 717 North Second Street, Suite 300; Harrisburg, PA 17102-3211; (717) 238-1222.

Thursday, March 11, 1999

CNYAPG Meeting: We have a full agenda, featuring two technical talks in one evening. Mr. Bill Morrow, with Parratt-Wolff Inc., will discuss, "Practical Considerations for Well Design, Installation, and Development". Dr. Jack Anderson, with Columbia Analytical Services, Inc., will be presenting the development and application of a new screening technique for dioxin, furans, PCBs, and PAHs. The evening will start earlier than usual to fit in a full agenda (see below).

Saturday & Sunday, March 20 - 21, 1999

Buffalo Geologic Society's 31st Annual GEM - MINERAL - FOSSIL SHOW at the Erie County Fairgrounds in Hamburg, NY.

Monday - Wednesday, March 22 - 24, 1999

Northeastern Section GSA Meeting, in Providence, Rhode Island. Contact O. Don Hermes, Department of Geology, University of Rhode Island; (410) 847-2192; e-mail: dhermes@uriacc.uri.edu. Call by February 12th for the pre-registration fee.

Tuesday, March 23, 1999

New York State Wetland Forum, Inc., 1999 Meeting; "Balancing Wetland Interests - Science, Policy, & Economics". In addition to a host of speakers discussing hydric soils, economic development, and regulatory information, this meeting includes exhibitors, poster sessions, and three local field trips. Kevin Bernstein, February's CNYAPG dinner speaker will talk about Recent Wetland Cases. The Hotel at Exit 37, 411 Electronics Parkway, Liverpool NY. For more info: (518) 783-1322.

Thursday, April 8, 1999

Back by popular demand...**An Update on Onondaga Lake Issues for CNYAPG.** Note: This evening will be hosted at the Marriott at Carrier Circle. Mr. Tim Mulvey with the Onondaga Lake Clean-Up Corp. will discuss the legal, political, and scientific aspects of lake remediation. Dr. John Ferrante, aquatic ecologist with the Atlantic States Legal Foundation, will brief us on the technical issues surrounding lake Superfund sites.

Thursday & Friday, April 15 & 16, 1999

Unified Watershed Assessment: Where Do We Go From Here? The American Water Resource Association Mid-Atlantic Conference to be held in Matamoras, PA. Unified watershed assessments, restoration priorities, and strategies are cornerstones to the Clean Water Action Plan. Join a multi-disciplinary group to reflect on key questions. For info, contact: Glenn Maurer at (717) 787-2666, or e-mail him at maurer.glenn@a1.dep.state.pa.us.

Thursday, April 29, 1999

ASCE & BAPG will cosponsor a seminar "RBCA - Now or Never" at the Chester F. Carlson Center for Imaging Science (Bldg. 76) at R.I.T. Registration at 5:45 PM, program from 6:15 - 9:30 PM. Speakers will address Site Characterization/Risk Assessment, Cleanup Requirements, Remediation Monitoring, and Qualification Requirements for RBCA Analysts. Contact Paul Micciche at (716) 381-2210, ext. 715, for further information.

Thursday, May 13, 1999

March CNYAPG Meeting: Return to the rustic setting at the Glen Loch. Pre-dinner hour features cash bar. Dinner will start by **6:15 PM**. Our guest speakers begin at **7:15 PM**. The cost is \$15 when reserved at least 24 hours in advance and \$17 that evening. Students with IDs enter for \$10. *Help us plan; reserve early* Contact Buck Gabriel at (315) 437-6100, ext. 2656.

Urban Geology Walking Tour with Mr. Bob Preyer of the MOST. Tour downtown Syracuse, reflecting on the geologic origins of local building materials and stone work. The tour will conclude with dinner and end-of-year party at a downtown pub location.

The Board Members would like to thank all of the corporate and individual supporters of CNYAPG throughout the past year. We would like to encourage you to continue your pledge of support throughout the upcoming year. Contact Steve Crook at (315) 437-1429 or (518) 827-5720 details.

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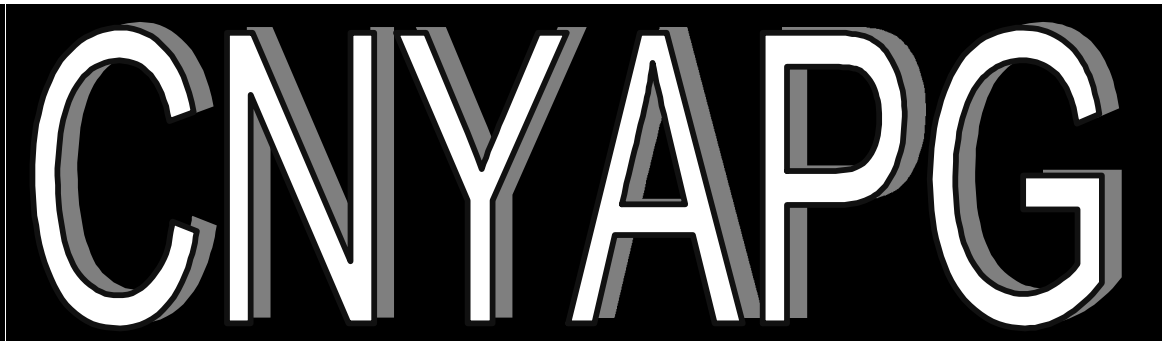
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Dewitt, NY 13214

CNYAPG MISSION STATEMENT

The CNYAPG was founded in 1993 to strengthen and advance the geologic sciences as a profession and to provide an open forum for the exchange of ideas; to promote the protection of public welfare through the professional practice of geologic sciences; to inspire and maintain the highest standards of professional conduct, business ethics, and personal honor of the membership; to foster the spirit of scientific research throughout the membership; to publish and otherwise disseminate information related to the geologic sciences and associated technologies; to maintain and encourage intra- and inter-association activities, to enhance the association's programs, and to encourage the affiliation of individual members with other scientific and technical organizations.





**April 8th
Meeting:**

**Onondaga Lake
- Perspectives
and Positions**

with
Mr. Tim Mulvey
and
Dr. John Ferrante

We will convene early on Thursday, April 8, at 5:00 PM, at the Marriott Hotel at Carrier Circle in East Syracuse, NY. Dr. Ferrante begins his presentation at 5:30 PM; dinner is at 6:25; and Mr. Mulvey speaks at 7:30. It will be a another full evening's program that you won't want to miss! We look forward to seeing you then!

For a full
overview of our
April program,
see Page 2.

1999 - 2000 CNYAPG ELECTION BALLOT

It's that time of year we all eagerly await: CNYAPG Elections for Officers and Directors! No blaring TV ads, billboard campaigns, handshaking and baby-kissing; just one simple ballot to fill out and return with your selections among those who have volunteered to take on the jobs that need to be done. Thank you to all of those who are willing to serve the organization! Officers and Directors are elected from among the membership of the Association by proxy (i.e., this ballot), and all qualified members in good standing are eligible to vote. Please circle the candidate's name or write in an unnamed candidate to indicate your vote. The results of this proxy will be presented at our May 1999 meeting.

The Immediate Past President will be Vita DeMarchi, and Gerry Gould steps down as Secretary but has offered to continue his tremendous effort in maintaining our Web page. Thanks Gerry! We also welcome two new nominees for Director, Nan Nelson and Stuart Holtzclaw. Please note that if you are a member, you are encouraged to run for office in CNYAPG's yearly elections. Also, Vita DeMarchi and Georgia Popoff will continue to produce the newsletter throughout the upcoming season.

1999 - 2000 BOARD OF DIRECTOR CANDIDATES

POSITION	CANDIDATE	WRITE-IN CANDIDATE
PRESIDENT:	Buck Gabriel	_____
VICE PRESIDENT:	Greg Flick	_____
ASSOCIATE VICE PRESIDENT:	Steve Crook	_____
SECRETARY/TREASURER:	Lynette Mokry	_____
DIRECTORS:	George Kelley	_____
	Chris Gachowski	_____
	Nan Nelson	_____
	Stuart Holtzclaw	_____

Comments: _____

Send To: CNYAPG, P.O. Box 567, Dewitt, NY 13214 by April 16, 1999, or bring them to the April meeting on April 8th.



Central New York Association of Professional Geologists
presents
Onondaga Lake Update - Perspectives and Positions
Featuring Mr. Timothy Mulvey of the Onondaga Lake Clean-Up Corp. and
Dr. John Ferrante with the Atlantic States Legal Foundation

Thursday Evening, April 8, 1999 at the Marriott at Carrier Circle, East Syracuse, New York

The Agenda starts early:

- Private Cash Bar open between 5:00 and 7:00 p.m.
- **Dr. John Ferrante** will present between 5:30 and 6:15 p.m.
- **Dinner** will be served starting at 6:25 p.m.
- The featured speaker of the evening, **Mr. Timothy Mulvey**, will begin his presentation at 7:30 p.m.
- The evening will conclude with questions and discussion with our guest speakers.

Dr. John Ferrante is involved in evaluating Onondaga Lake Superfund programs as a part of USEPA Technical Assistance Grant administered by the Atlantic States Legal Foundation. His primary role is to interpret the multitude of ongoing activities and support the dissemination of information to surrounding communities. The Onondaga Lake Superfund program is complex because it is managed under a cooperative agreement between the USEPA and New York State and administered by the NYSDEC. This results in an intertwining of federal and state requirements and implementation steps at eight subsites under separate Consent Orders and schedules, leading to a difficult decision-making process. This program is technically complex and very confusing for many residents. Adding to the confusion is the fact that Onondaga County is under a separate 15-year, \$380 million consent Judgment to reduce nutrient and bacteria loading to the Lake. Little public involvement is evident because of the inherent complexity and multiplicity of actions and, since some of the activities in the Lake are restricted, risks to human health are relatively low, resulting in general apathy as it relates to Lake restoration. Dr. Ferrante will give a concise update on these issues and answer questions you may have about the progress and potential for our Lake.

Dr. Ferrante received his Doctorate at the University of New Hampshire in 1974, specializing in Systems Ecology. His background shows a wide range of experience from Chief Scientist on oceanographic research in the mid-Atlantic Ocean, steam assessments in the Southwest desert, to coral reef impact assessments in Hawaii. He also has extensive experience in environmental management systems, regulatory compliance, and management of radiological waste. Born and raised in Solway, New York, Dr. Ferrante has worked throughout most of the United States and in Europe; he has returned to Central New York to work on the remediation of Onondaga Lake.

Mr. Timothy Mulvey cites that a 1993 poll of Onondaga County residents revealed that, while most know that the lake is polluted (90%+), less than half of the community can name one source or type of pollution affecting the Lake. Onondaga Lake has been polluted for so long that most of the community has effectively given up any hope of restoring it for recreational and commercial use. Key to changing that perception, is fostering a better understanding of what the Lake's problems truly are. The size/location of the City of Syracuse, and surrounding suburban areas, has put a great deal of stress on the Lake. Industrial waste disposal into the Lake for almost a hundred years contributed to its severely degraded state, compounded by a series of historical and community failures concerning sewage treatment and disposal. Since the end of World War II, the Syracuse community has struggled unsuccessfully to adopt an environmentally responsible and financially sensible sewage treatment program. As a result, the continuing controversy over the METRO sewage treatment plant, its location, and size of its discharge, has effectively crippled lake restoration efforts. Dealing with METRO has become the center, and crux, of any resolution of Onondaga Lake's pollution problems.

The scientist and lay citizen need to understand that not all "pollution" is the same. Industrial contamination and sewage treatment must be dealt with as separate/distinct problems. The public's role and responsibility in sewage collection and treatment is directed through our elected officials. An understanding of the nature/characteristics of sewage waste, effect on Onondaga Lake and environment, and alternatives for METRO are key to the ultimate success of any Onondaga Lake restoration effort.

Tim Mulvey is a lifelong resident of the Syracuse area. He is a graduate of North Syracuse High School, SUNY College at Potsdam and Syracuse University College of Law. Mr. Mulvey was an Associate Attorney at Grass, Balanoff & Whitelaw in Syracuse until 1990. Since 1990, he has been actively involved in all aspects of the "Onondaga Lake Cleanup." After also serving as a special assistant to U.S. Senator Daniel Patrick Moynihan, Mr. Mulvey was appointed Executive Director of the Onondaga Lake Management Conference in 1990. At the same time, he formed the Onondaga Lake Cleanup Corp. (OLCC), a not-for-profit organization dedicated to administering programs and projects for the restoration and rehabilitation of Onondaga Lake. Over the last nine years, the OLCC has handled government contracts in excess of \$6 million, to address a range of problems associated with Onondaga Lake, from the Tully Valley mudboils, to the Allied wastebeds, to oxygen resources in the lake and Seneca River, and restoration of aquatic habitat in and around the lake.

Make your reservations early! Call Buck Gabriel at (315) 437-6100, extension 2656, prior to Monday, April 5th to guarantee that you've got a place for this very significant evening! The cost for this program and dinner is \$22 and the student discount (with valid ID) is \$18. If you're coming from out of town and need directions, call the Marriott at (315) 432-0200. For further information or if you have questions, call Vita DeMarchi at (315) 475-9204.

CNYAPG CALENDAR

Monday-Wednesday, March 22-24, 1999

Northeastern Section GSA Meeting, in Providence, Rhode Island. Contact O. Don Hermes, Department of Geology, University of Rhode Island; (410) 847-2192; e-mail: dhermes@uriacc.uri.edu. Call by February 12th for the pre-registration fee.

Tuesday, March 23, 1999

New York State Wetland Forum, Inc., 1999 Meeting; "Balancing Wetland Interests - Science, Policy, & Economics". In addition to a host of speakers discussing hydric soils, economic development, and regulatory information, this meeting includes exhibitors, poster sessions, and three local field trips. Kevin Bernstein, February's CNYAPG dinner speaker will talk about Recent Wetland Cases. The Hotel at Exit 37, 411 Electronics Parkway, Liverpool NY. For more info: (518) 783-1322.

Wednesday, March 24, 1999

Niagara Frontier Section of AWMA Annual Seminar, "Taking Care of Business: Environmental Success Stories," at the Holiday Inn on Grand Island. Call Jacquelyn Zajac at (716) 741-2049 for info.

Thursday, April 8, 1999

Onondaga Lake Update - Perspectives and Positions. Note: This evening will be hosted at the Marriott at Carrier Circle. Mr. Tim Mulvey with the Onondaga Lake Clean-Up Corp. will discuss the legal, political, and scientific aspects of lake remediation. Dr. John Ferrante, aquatic ecologist with the Atlantic States Legal Foundation, will brief us on the technical issues surrounding lake Superfund sites. The evening's agenda starts early (5:00 p.m.) to allow time for speaker interaction. Join us at the Marriott at Carrier Circle, East Syracuse. First speaker begins at 5:30 p.m. For more info, call Vita DeMarchi at (315) 475-9204. For reservations, call Buck Gabriel by Monday, April 5th, at 437-6100, extension 2656. Cost: \$22; \$18 for students with valid ID.

Thursday & Friday, April 15 & 16, 1999

Unified Watershed Assessment: Where Do We Go From Here? The American Water Resource Association Mid-Atlantic Conference to be held in Matamoras, PA. Unified watershed assessments, restoration priorities, and strategies are cornerstones to the Clean Water Action Plan. Join a multi-disciplinary group to reflect on key questions. For info, contact: Glenn Maurer at (717) 787-2666, or e-mail him at maurer.glenn@a1.dep.state.pa.us

Thursday-Sunday, April 15-18, 1999

26th Annual Rochester Mineralogical Symposium. contact Dr. Helen H. chamberlain, P.O. Box 85, Manlius, NY 13104-0085.

Wednesday, April 21, 1999

BAPG Monthly Meeting at the Little White House, 5877 Main Street, Williamsville, NY.

HMPGA presents "Environmental Forensics," by Dr. Jun Abrajano of RPI. Call Diane Trianni at (518) 452-0096 for further information.

Thursday, April 29, 1999

ASCE & BAPG will cosponsor a seminar "**RBCA - Now or Never**" at the Chester F. Carlson Center for Imaging Science (Bldg. 76) at R.I.T. Registration at 5:45 PM, program from 6:15 - 9:30 PM. Speakers will address Site Characterization/Risk Assessment, Cleanup Requirements, Remediation Monitoring, and Qualification Requirements for RBCA Analysts. Contact Paul Micciche at (716) 381-2210, ext. 715, for further information and see the insert in this newsletter.

Urban Geology Walking Tour with Mr. Bob Preyer of the MOST. Tour downtown Syracuse, reflecting on the geologic origins of local building materials and stone work. The tour will conclude with dinner and end-of-year party at a downtown pub location.

Thursday, May 13, 1999

HMPGA Technical Symposium at Earth Tech, Inc., 12 Metro Park Road, Albany, NY from Noon to 9 PM; includes Student Poster Session at 5:30, social hour from 5 - 6 PM, dinner at 6 PM. See the insert to the newsletter for further details and contact information.

Wednesday, May 19, 1999

* CONTRIBUTIONS TO THIS MONTH'S
CNYAPG NEWSLETTER
WERE MADE BY:
Vita DeMarchi Gerry Gould
Georgia Popoff

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C N Y A P G

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www.dreamscape.com/cnyapg

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarchi@secor.com

URBAN GEOLOGY WALK

Presented by

ROBERT W. PREYER

Milton J. Rubenstein Museum of Science & Technology (MOST)

Syracuse, New York

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Geologic News
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**CNYAPG
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**CNYAPG
Calendar** 5

We will convene on Thursday, May 13 at 5:30 PM, at the MOST and journey through downtown to Traditions of Syracuse (corner of E. Washington Street and S. Salina Street) for cocktails and hors d'oeuvres when we have completed our walkabout! We look forward to seeing you at the season finale!

For the final meeting of the 1998-1999 season of CNYAPG, we will be taking a walking tour of downtown Syracuse to view the architecture and geology of our city from a multi-disciplined scientific approach (with a lot of fun layered in). Some of the questions to be posed by our tour guide, Mr. Robert Preyer, educator and coordinator of summer programs for the MOST, include:

- ▶ Where can we find soda straw stalactites and flowstone in Downtown Syracuse?
- ▶ What can we learn about Central New York from Onondaga Creek?
- ▶ What geologic processes could have created the "stratigraphy" of the stone used in the beautiful older architecture in the city?
- ▶ How can we analyze the building materials in the downtown structures many of us pass daily?

With this creative, unusual presentation, we are expecting a wide variety of disciplines to be presented: professional geologists, hydrologists, engineers, environmental scientists, and architects; therefore, Mr. Preyer will be exploring the downtown area of Syracuse, playing brain games and presenting outrageous hypotheses, he offers. The walk will start at the MOST and will lead from Onondaga Creek, down Jefferson and S. Warren, ending at *Traditions of Syracuse* at E. Washington and S. Salina Streets. This journey will be completed rain or shine so, if necessary, bring umbrellas and dress to accommodate the weather.

Mr. Preyer invites all of the participants to form opinions and express yourself freely during this investigation. But he also asks that everyone remember that this is a fun activity, not a dissertation defense. He will be making the evening of May 13th one for curiosity and laughter as we stroll the streets of Syracuse together looking for science treasures.

Robert W. Preyer has a BS in Chemistry Education with a minor in Geology from SUNY Cortland and did Masters work in geology and geochemistry at Franklin and Marshall College, Lancaster, PA. At the MOST, he has conducted three summer camps in geology, and he taught an Elderhostel on "An Introduction to the Geology of Central New York." He has also offered astronomy labs at Syracuse University with the MOST's portable planetarium.

Previously, Mr. Preyer taught at Longwood College in Farmville VA, in a program to recertify teachers in Earth Science. He has taught courses in Oceanography, Astronomy, and Environmental Chemistry/Geology. So put on your walking shoes (or hiking boots) and meet Mr. Preyer at the MOST on May 13th!



PRESIDENT'S PAGE

Thank you to last month's speakers, **Mr. Timothy Mulvey and Dr. John Ferrante**, for the informative, interactive, and entertaining presentation of issues surrounding future remediation plans for Onondaga Lake. I was pleased that our audience included members of the community not involved in geology or engineering. The "press" was there and Dr. Ferrante gave an interview that evening that aired on WAER radio the next morning. We were also pleased that James Fox, our CNYAPG member residing in Ontario, Canada, was able to attend. I received excellent feedback from a few people in attendance, including the fact that although the studies and conclusions surrounding lake clean-up are "old" and remain true to date, the presentations were contemporary and conscientious reminders as to various public perspectives and political influences involved in actually implementing a rehabilitation program for Onondaga Lake. I anticipate this will not be the last time we need an update on lake issues, particularly with the more recent proposal by Ogden Water Systems to implement the "skeleton" clean-up plan.

Join us on May 13 for the last CNYAPG gathering of the season. This month's gathering will be casual and end of season *Party* time is the theme. Keep in mind the *Wine and Beer Open Bar* being offered at Traditions after the Urban Geology Walk. We will be announcing the 1999/2000 newly-elected board members this evening....hmmmm, I wonder who will be among them?

Looking to next season, CNYAPG plans to vary our

monthly dinner meeting format throughout the season and rumor has it the newsletter may get a new millennium look as well. CNYAPG is beginning tentative plans for a technical symposium after the new year. The key questions we are asking in the planning stage are, "What technical topics are members interested in spending time and money to attend and how much time and money are we willing to spend?" All suggestions for a CNYAPG symposium are welcome. Let any of the board members know your ideas, or better yet, volunteer to assist in the programming. Several members have voiced interest in another CNYAPG field trip. Again, any suggestions are welcome. With your participation and contribution, we plan to make next season a success.

Financially speaking, CNYAPG has been fortunate enough to have a small financial reserve from which we have slowly whittled to cover various operating costs. It is interesting to note that membership renewals are basically enough to cover the costs of issuing a monthly newsletter. We currently have enough reserve to cover the needed up-front costs to organize next year's symposium and potentially provide a travel and speaker fee to bring a national speaker to CNYAPG. My point is, we currently have the opportunity to bring in a few national speakers and organize a symposium to benefit our organization and the larger community of professional geologists. As always, the best financial support for CNYAPG is you, the members. Support CNYAPG by attending the meetings. Thanks to everyone who renewed their membership and to all the new members who joined us this

year. The renewal rate is about 95%.

I want to thank all the CNYAPG advertisers. I know several people who actually copy the page and use it for easy reference when looking for recommended subcontractors. We hope to have you all back as advertisers next year.

Given that this is my last *President's Page*, one opportunity I admit I won't miss (good luck Bill, I am sure your column will be brilliant), I want to thank everyone on the Board of Directors for their volunteer time and general support in making the season a successful one. I wish I had a passionate topic to rant about in my last column. As I said before, I particularly enjoy being involved in CNYAPG for the interaction with other geologists, engineers, students, and yes, the attorneys that attend our meetings. This year has particularly expanded my perception of the various working roles geologists are involved in. I have had the opportunity to meet new people and get to know others better. Thanks to everyone for making my experience as president a rewarding and satisfying one.

Best wishes to all for a fun filled summer. Have a safe field season.

Vita DeMarchi, P.G.
Future Past President

GEOLOGIC NEWS

In the Know...
with Jon S. Fox

Geochemical Research Notes

Results of numerous research studies were to be presented at the 217th American Chemical Society National Meeting in Anaheim, California, between March 21 and March 25, 1999. Several presentations sponsored by the Division of Environmental Chemistry (DEC) may have had important implications in remedial projects. Page numbers listed in parentheses below refer to DEC Preprints of Extended Abstracts, Volume 39, Number 1.

- ◆ Researchers from the Massachusetts Institute of Technology and the University of Connecticut are studying potential enhanced removal of chromium from a contaminated aquifer through injection of citrate. Apparently, a significant percentage of chromium is adsorbed onto colloidal particles in the aquifer. The citrate apparently enhances removal of chromium, as demonstrated through analysis of influent and effluent samples (pp. 342-343).
- ◆ Researchers from the University of Michigan have been evaluating reductive transformation of halogenated organic compounds by iron sulfide (pp. 348-350). As expected, kinetic variations are observed for different compounds. As many geologists are aware, certain rock formations (particularly organic-rich sedimentary rocks) may contain significant amounts of iron sulfide as pyrite or marcasite. Therefore, these terrains may facilitate enhanced natural reductive de-halogenation in groundwater.
- ◆ Researchers from Texas A&M University have been experimenting with different zero-valent metals and combinations of zero-valent metals for remediation of chlorinated ethenes and acetylenes (pp. 351-353).

Preliminary data suggest the fastest reaction (degradation) rates were obtained using palladium-coated iron and palladium-coated zinc (however, I noticed the authors did not mention the cost of these materials!). Generally, iron had higher reactivities with chlorinated ethenes compared to zinc, with the notable exception of tetrachloroethene (PCE).

Interstellar PAH

Polycyclic aromatic hydrocarbons (PAH) such as chrysene and benzo(a)pyrene occur naturally on Earth and have been identified in the interstellar environment. Recent research published in the journal *Science* (1999, v. 283, p. 1135) indicates several pre-biotic molecules including polycyclic alcohols, ketones, and ethers have been produced by bombarding PAH-laden ice with ultraviolet light under space-like conditions. Additionally, several more complex organic molecules such as quinones and aromatic alcohols which are ubiquitous in organisms on Earth were also isolated. These data suggest organic compounds present in interstellar environment may be modified by typical astrophysical processes into compounds utilized in carbon-based organisms.

Job Search

Are you looking for new employment? The Geological Society of America (GSA) offers an Employment Matching Service. Numerous firms which employ geoscientists use the service to help find individuals for positions. Your name and resume are provided to all participating employers. The cost for a one-year listing is \$35.00 for GSA members and \$65.00 for non-members. Additional information and an application form can be found at the GSA website (www.geosociety.org).

Mercury in the St. Lawrence River

Research published in *Environmental Science and Technology* (v. 33, pp. 840-849) presents data and mass balance calculations regarding dissolved and particulate mercury in the St. Lawrence River drainage basin. Samples were

collected at major Canadian tributaries and the mouth of the St. Lawrence River. Review of these data indicate gross mercury export from the river is approximately 5.9 kmol/year with approximately 73% of exported mercury occurring in particulate form and the remainder in dissolved form. Approximately 75% of the mercury was apparently derived from tributaries and erosion of the riverbank with less than 10% derived from Lake Ontario. Anthropogenic point sources apparently account for less than 5% of particulate mercury. Mass balance calculations suggest approximately 88% of mercury contributed to the St. Lawrence River remains in the watershed, primarily deposited in sediments.

Evaluating Recharge with Isotopes

Groundwater level monitoring combined with analysis for major cations, anions, dissolved organic carbon (DOC), and hydrogen and carbon stable isotopes were employed to evaluate recharge in the Raisin River basin near Cornwall, Ontario (*Ground Water*, v. 37, no. 1, pp. 133-139). The geology of the area generally consists of sandy glacial till overlying Paleozoic carbonate bedrock. The proximity of the study area to similar surficial and bedrock geology suggests the results may apply to adjacent portions of northern New York State (Jefferson, St. Lawrence, and Franklin counties). High correlation was observed in stable carbon isotope ratios in groundwater from all 12 study wells. These and other data suggest recharge occurs primarily in the spring and late fall with minor contributions in early summer. Contributions in summer apparently are limited by plant transpiration while contributions in winter are limited due to frost. Variations in carbon stable isotope ratios and DOC are used to delineate contributions from native versus cultivated vegetation.

Evolution Gap Research

University of Chicago developed new research methods to evaluate gaps in the fossil record. These methods, consisting of data compilation and mathematical modeling, were initially used to address the question: When did modern mammals first evolve? For decades, scientists believed mammals evolved about 65 million years ago; however, last year Penn State scientists concluded that mammals evolved about 130 million years ago, based on the current rates of genetic change. The University of Chicago researchers believe the more recent evolution date, based on their research. They evaluated the completeness of the fossil record mathematically to determine if there are gaps in the fossil record or the mammals did not evolve yet. Simply put, the fossil record is not that poor to have no evidence of mammals for 60 million years. However, researchers acknowledge that the fossil record buried beneath ice in Antarctica could provide a more data, if accessed, because this area of the earth supported abundant life millions of years ago. The University of Chicago researchers believe that the rates of genetic change are not constant and change unpredictably. The theory that mammals evolved 65 million years ago also corresponds to the demise of the dinosaurs. With the dominant dinosaurs waning, mammals could proliferate and diversify. (*Chicago Tribune*)

Cool News from the Internet

Don't have time to read all those technical journals piling up? Here's an EPA web site that summarizes current innovative technologies < www.clu-in.org >. Innovative technology news is separated into five categories:

- ◆ Market/commercialization information
- ◆ Cleanup news
- ◆ Demonstration/feasibility studies
- ◆ Research
- ◆ General news

Examples of the types of information summarized recently include the following titles:

- ◆ Remediation of soils and wastes contaminated with uranium and toxic metals
- ◆ "Sweet" technology to treat

- ◆ contaminated groundwater
- ◆ In-situ hydrothermal oxidative destruction of DNAPLs in a creosote contaminated site
- ◆ Experimental investigation of steam injection in fractured porous media
- ◆ Geostatistical analysis of TPH degradation in field soils
- ◆ Pilot scale devices for remediation of munitions contaminated soils
- ◆ End-points of PAHs in soil treatment
- ◆ Grand challenge problems in environmental modeling and remediation
- ◆ Conceptual feasibility study for centralized treatment of petroleum contaminated soil
- ◆ Hazardous wastes sites: state cleanup practices

Entries came from:

- ◆ *Hazardous Waste News*
- ◆ *Nuclear Waste News*
- ◆ *Environmental Science and Technology*
- ◆ *Superfund Week*
- ◆ *Civil Engineering*
- ◆ *Water Science and Technology*
- ◆ *Journal of Environmental Science and Health*
- ◆ *Waste Management & Research*
- ◆ *DOE*
- ◆ *EPA*
- ◆ *Journal of Membrane Science*
- ◆ *Groundwater Monitoring and Remediation*
- ◆ *Proceedings from Conferences*

You are Still Needed!

Keep the newsletter input coming. Send ideas, articles of interest, requests, and questions for the newsletter to Vita DeMarchi at vdemarchi@secor.com.

Do You Support the Geologists' Licensure? Write a Letter! Make Your Voice Be Heard
by William Kelly, President, NYSCPG

A proposed law to establish professional licensure for geologists, sponsored by the New York State Council of Professional Geologists (NYSCPG), has been introduced into both houses of the New York State Legislature. If you wish to support such an initiative, if you wish to *strengthen the profession of geology*, **write a letter now!** Here are the details:

The revised language of the bill is posted on the NYSCPG web page, found at:

<http://pbisotope.ess.sunysb.edu/nyscp>

In a nutshell, changes in this year's version of the bill deal with more activist definitions of "geology" and "practice of geology," removal of language referring to "incidental practice" by engineers and geologists, and the provision for a combined board of engineering, land surveying, and geology. The bills in the Senate (bill no. S03263) and Assembly (bill no. A06281) carry different numbers from those of last year since we are in a new legislative season.

Who Do I Write To?

Write directly to your local Assemblyman and Senator. Letters of support should be kept to a single page. Mention the bill number in your letter and ask for the legislator's support. In addition to the letter to your representatives, we request that the NYSCPG and the Chairmen of the Higher Education Committees of the Senate and Assembly be included on the "cc: list. The two Higher Education Committees are the ones in which the fate of the bill will be decided and the respective Chairmen are Senator Kenneth LaValle and Assemblyman Edward Sullivan. Send one copy of your letter to NYSCPG, c/o Jean Neuback at Alpha Geoscience, 400 Trillium Lane, Albany, NY 12203 and she will then forward your letter to the Higher Education committee chairmen.

Wednesday, May 12, 1999

Northeast Section AIPG 1999 Spring Meeting in the Seismology Building at Lamont-Doherty Earth Observatory, Route 9W, Palisades, NY from 4 - 8 p.m. Dr. Paul Olsen and Dr. Dennis Kent will present the Newark Basin Coring Project (NBCP) and the Pole-to-Pole Coring Transect of Triassic-Jurassic Pangea. The NBCP was a scientific drilling project in which the goals were to recover a very long a detailed record of ancient continental climate, unravel the history of one of the largest and longest lived rift basins, and produce a magnetic polarity time scale for the Late Triassic. More information can be found at <http://www.ldeo.columbia.edu/>. For directions to the meeting, go to:

http://ldeo.columbia.edu/what/campus_map/c_campusmap_main.html.

To register, contact Dan St. Germain, c/o Malcolm Pirnie, Inc., One International Boulevard, P.O. Box 601, Mahway, New Jersey, 07430-0601.

Thursday, May 13, 1999

* CONTRIBUTIONS TO THIS
MONTH'S
CNYAPG NEWSLETTER
WERE MADE BY:

Vita DeMarchi Jon. S. Fox
Gerry Gould Bill Kelly
Nancy Gensky Georgia Popoff

CNYAPG Walking Tour with Mr. Bob Preyer of the MOST. Tour downtown Syracuse, reflecting on the geologic origins of local building materials and stone work. The tour will conclude at **Traditions of Syracuse**, located at the corner of S. Salina and E. Washington Streets. There will be an open wine and beer bar from 6:30 to 8:00 p.m. and a spread of munchies to appease the tastes of all. The cost for all of this fun is a mere **\$15.00** and you must **make your reservation by May 10th at the latest. Call Buck Gabriel at (315) 437-6100, ext. 2656 to guarantee your participation in the CNYAPG season finale!**

The Board Members would like to thank all of the corporate and individual supporters of CNYAPG throughout the past year. We would like to encourage you to continue your pledge of support throughout the upcoming year. Contact Steve Crook at (315) 437-1429 or (518) 827-5720 details.

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CNYAPG MISSION STATEMENT

The CNYAPG was founded in 1993 to strengthen and advance the geologic sciences as a profession and to provide an open forum for the exchange of ideas; to promote the protection of public welfare through the professional practice of geologic sciences; to inspire and maintain the highest standards of professional conduct, business ethics, and personal honor of the membership; to foster the spirit of scientific research throughout the membership; to publish and otherwise disseminate information related to the geologic sciences and associated technologies; to maintain and encourage intra- and inter-association activities, to enhance the association's programs, and to encourage the affiliation of individual members with other scientific and technical organizations.

