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Houston Geological Society
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Quantitative Seismic Geomorphology and Reservoir Architecture of Clastic Depositional Systems: The Future of Uncertainty Analysis in Exploration and Production

Page 19

Earth Science Week 2004: Living with a Restless Earth

The Bulletin
Houston Geological Society

Volume 47, Number 4 December 2004

In Every Issue

about the cover: .Crater and plume image, Mount St. Helens. USGS photograph taken at 12:13:01 PDT on October 1, 2004, *Photo by John Pallister*

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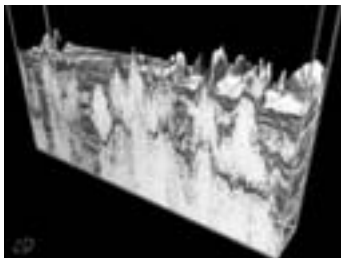
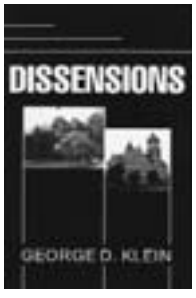


page 19

page 33

page 49

page 51



page 55

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by Steve Levine

President's Letter

Showing Their Muscle: Regional Geological Societies Show Impressive Community and Organization Spirit

Most of the HGS membership is incredibly busy with work, family, household chores, commuting and numerous outside interests. That is why I am often amazed by the dedication of our own members in that they routinely set aside "spare" time for the HGS. We are a proud organization of approximately 4000 members, bearing a vast pool of talented, resourceful and generous people.

One volunteer can make a huge impact on the entire society.

Many of our members have arrived from our sister societies within the Gulf Coast, west Texas, Rockies and International and were volunteers previously. We want you to be an active part of the HGS as well, and your contributions may result in revolutionizing the HGS. Many of these members worked hard to keep their previous societies vibrant and energetic and know that every member is valuable to society success. One volunteer can make a huge impact on the entire society.

I have listed here a number of the ongoing activities within some of our sister GCAGS organizations with smaller pools of volunteers. I believe you will find that they indeed remain robust and visionary.

Alabama Geological Society

http://homepage.mac.com/jpashin/AGS.htm 300 members
President- Larry Rheams lrheams@bellsouth.net

- Conducted the 41st annual AGS fall field trip in early November to study Alabama coastal deposits and ecosystems. Another field trip is scheduled in the spring.
- Sponsors the Alabama State Science and Engineering Fair.
- Distributes scholarships recognizing two exceptional students at Alabama universities.

Austin Geological Society

www.austingeosoc.org 110 members
President- Craig Caldwell craigc@austingeosoc.org

- Developing informal morning meetings of retired geologists in the Greater Austin area.
- Will soon offer ethics training and professional/technical presentation credit at their meetings to registered geoscientists under proposed rules by the Texas Bureau of Professional Geoscientists.
- Conducted annual fall field trip to the central Texas Llano uplift area with university professors presiding.

Corpus Christi Geological Society

www.ccgeo.org 290 members
President- Brent Hopkins

The Corpus Christi Geological Society has raised over $100,000 for a book titled *Wooden Derricks and Iron Men*. It is due to be published within the next few months. The CCGS has also begun a videotape collection of 20+ interviews for preparation of a documentary of the same title.

- The CCGS has a vibrant education committee that conducts numerous programs with the local K through 9th grade schools and the community, including:

  Junior Rock Hound Program - This program succeeded in involving 1200 K through 9th grade students and 30 teachers in the Corpus Christi area. It includes a 45-minute lecture, donation of a set of 30 rocks/minerals plus a geologic map of the USA to each class, and a mineral for each student.

  Annual Bayfest - The CCGS seeds a giant sandbox with minerals and volunteers help the students identify what they find.
- Hosted the Conference for the Advancement of Science Teaching (CAST) for an estimated 5000 teachers in Corpus Christi on November 4–6. (Next year CAST returns to Houston on October 27–29, 2005.)
- Began holding occasional meetings at the Texas A&M-Corpus Christi campus and offering a free lunch to any student that attends the meeting.

President's Letter *continued on page 7*

President's Letter continued from page 5

East Texas Geological Society

www.EastTexasGeo.com 200 members
President- Bob Hulse map@tyler.net

- Will conduct a 6th annual tech expo "Tech 2005" with featured speakers and 450 participants on April 7, 2005 in Tyler.
- Co-developed with the BEG digitizing to CD format all of the society's east Texas field study publication volumes.
- Established a new website in 2004.

Lafayette Geological Society

www.lgsweb.org 350 members
President- Barry Wawak barry.wawak@corelab.com

- The LGS has been actively involved in a program to seek funding for the construction of a 170-seat 3D visualization center at the University of Louisiana-Lafayette energy center. The state of Louisiana has approached the LGS to sponsor a grant to train independent and consulting geologists in 3D seismic interpretation using this new visualization center.
- Held a get-acquainted mixer with the LGS members and University of Louisiana-Lafayette students at the beginning of the school semester. Introduced students to the LGS Board and inquired of each student's primary area of interest. Encouraged students to join the LGS and AAPG and to begin networking with local professionals, volunteer with various committees in the LGC, and attend the LGC monthly luncheons.

New Orleans Geological Society

www.nogs.org 610 members
President- Brenda Reilly brenda_reilly@murphyoilcorp.com

- Preparing to host the GCAGS Convention "Geological Gumbo: A Recipe for Success" on September 25–27, 2005, and currently requesting a call for papers.
- Seminar scheduled for spring, 2005 titled "Imaging Super-Deep Geology with Multicomponent Seismic Technology."
- NOGS conducts an organized student outreach program with over 60 talks at local schools during the year. The society maintains a large inventory of fossils and minerals for volunteer needs.
- Hosted the 6th annual Super Science Saturday event at the Louisiana Children's Museum with 70 volunteers and 800 children attending.
- Awarded nine scholarships totaling $22,500 to geology graduate and undergraduate students from three Louisiana universities.

Shreveport Geological Society

www.shreveportgeologicalsociety.org 204 members
President- Scott Caswell oilgeologist@yahoo.com

- Developed a new web page in 2004 (check it out, it is very nice).
- Provided 11 scholarships totaling $11,350 to students at Louisiana and Texas universities.
- Co-sponsored a field trip to the Cote Blanche Salt Mine with the Lafayette Geological Society.

South Texas Geological Society

www.stgs.org ~200 members
President- Ray Knox hrayknox@earthlink.com

- Conducted an "Essentials of Mapping " workshop in November.
- Hosted the GCAGS Convention in San Antonio in the October.
- Provided national AAPG leadership in Stewart Chuber (2003–04 GCAGS President) and Lee Billingsley (2005–06 AAPG President candidate).

HGS News

The HGS has added a **Volunteer of the Month Award** to the *Bulletin* and the website this year. These are volunteers selected by the Board for outstanding efforts as recommended through the membership. I encourage you to submit a request to a Board member or Committee chairperson for a volunteer of the month candidate or communicate a superb effort by a volunteer.

Earth Science Week was a terrific success this year. Martha McCrae and Jennifer Burton worked tirelessly before and during the week to make it so. My sincerest thanks go to the many volunteers at the Houston Museum of Natural Science "passport" Saturday, the Blue Lagoon field trip (which had over 200 attendees), and the Landmark-sponsored 3D visualization event, which was well presented by Landmark Business Development Manager Laurent Duchatel.

The **Continuing Education Committee** chaired by Jonathan Jee has put together a slate of three courses at modest prices:

1. Petroleum Reserves—Avoiding Write-Downs, Part One: An Overview of Reserve Definitions and Reporting Requirements on December 15.
2. Petroleum Reserves—Avoiding Write-Downs, Part Two: An Overview of Recommended Geological Practices on January 20, 2005.
3. Rock-Based Integration: Geologic Integration of Seismic and Petrophysical Data on February 17, 2005. ■

Happy holidays everyone.

HGS *Bulletin* Instructions to Authors

All materials are due by the 15th of the month, 6 weeks before issue publication. Abstracts should be 500 words or less; extended abstracts up to 1000 words; articles can be any length but brevity is preferred as we have a physical page limit within our current publishing contract. All submissions are subject to editorial review and revision.

Text should be submitted by email as an attached text or Word file or on a clearly labeled diskette in Word format with a hardcopy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator, Freehand, Canvas or CorelDraw. Files should be saved and submitted in .eps (Adobe Illustrator) format. Send them as separate attachments via email or on a diskette or CD if they are larger than 1 MEG each, accompanied by figure captions that include the file name of the desired image. DO NOT EMBED them into your text document; they must be sent as separate files from the text. DO NOT USE POWERPOINT, CLIP ART or Internet images (72-DPI resolution) as these do not have adequate resolution for the printed page and cannot be accepted. All digital files must have 300-DPI resolution or greater at the approximate size the figure will be printed.

Photographs may be digital or hard copy. Hard copies must be printed on glossy paper with the author's name, photo or figure number and caption on the back. Digital files must be submitted in .jpg or .eps format with 300-DPI or greater resolution at the printing size and be accompanied by figure captions that are linked by the file name of the image. The images should be submitted as individual email attachments (if less than 1 MB) or on CD or zip disk.

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The *Bulletin* is printed digitally using QuarkXPress. We no longer use negatives or camera-ready advertising material. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email to ads@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

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No. of Issues	Eighth	Quarter	Half	Full	Full	Full	Full	Half	Quarter
10	$762	$1284	$2304	$4383	$5260	$7250	$7000	$6350	$2500
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$125 per 10 Issues – Send two cards ($25 for each additional name on same card)	$6250 - 10 issues	(Black and editor's choice) add 15% to B&W cost

HGS Website Advertising Rates

The Houston Geological Society Website is seen by many people each day. In recent months, we averaged about 15,000 visitors per week. You have four options for advertising your company or your services on the Website.

For those companies already advertising in the *Bulletin*, their company names are posted on the Supporter page for free but they have the option to link this to their home page for an additional $10/month fee. If you have a product or service available at no charge, you can post it in the Business Directory at no charge. To arrange to put your ad on our Website or to get more information, send an email to Dave Crane (webmaster@hgs.org) or go to the HGS Website at www.hgs.org/ads.

Geo-related Business Directories can be posted directly by any registered user, subject to approval and payment. Resumes can be posted directly at no charge by any active HGS member and the webmaster will activate it as soon as practical.

	Home Page Logo Ad	Business Directory	Personal Resumes	Link to *Bulletin* Supporter's Web Site (URL)
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6 months	$385	NA	Free	$60
3 months	$200	NA	Free	$30
1 month	NA	NA	Free	$10

Note: Prices subject to change without notice.

by ***Arthur E. Berman, editor@hgs.org***

Editor's **Letter**

New Ideas and Their Diffusion

Twenty years ago a friend and I had a brilliant idea: if people could pay for their groceries with a credit card instead of writing a check, supermarket lines would move more quickly and the companies that owned the stores would have immediate payment. We researched the concept and consulted experts who told us that the idea would never work for a variety of reasons that aren't important now. What is important is that many of us now routinely pay for groceries and most other purchases with a credit or debit card. I don't even have a check book anymore and only use a few computer-generated checks each month to deal with the rare and somewhat backward companies that don't yet have a way to pay bills electronically.

Not everyone, of course, has embraced electronic payment of purchases and bills. I sometimes still find myself behind someone in line at a store who is writing a check, showing their driver's license and, ironically, waiting for electronic approval of their check. While it seems inevitable that some day everyone will abandon check books, it may actually take years or a generation before the newer idea of electronic payment has become the norm.

This raises two questions that are pertinent to us as geologists and scientists: how do new ideas originate and how do they spread? I believe these questions go to the core of geological inquiry and human psychology.

Consider the beginnings of geology. The ideas of James Hutton and Charles Lyell about the Earth, its age and the processes that governed the development of the crust and its sedimentary strata were considered radical in their time. These ideas were not easily or quickly accepted by the contemporary scientific community, much less the educated public. New notions about the Earth's history along with Darwin's observations on the origins of life a few years later significantly disturbed the belief structure of 19th century society.

E&P companies, if they are to survive, must re-establish new ideas and the inventive people who conceive them as the core capability of their organizations...Senior management must re-involve themselves in the world of technical ideas...and abandon the absurd notion that they are business people who can afford to leave science to technical risk committees.

New Ideas: Archetypal Ideas, Theories, Discoveries and Inventions

The origin of new ideas has been debated since at least the time of Socrates. I will briefly and humbly add my views on where ideas come from to those of Plato, Descartes, Leibniz and Kant.

It seems to me that there are relatively few truly new ideas. Ideas of God, the spirit or soul, the after-life or reincarnation may be examples of truly original thought. The idea of tools, language and writing must have originated more-or-less independently of observation or explanation. These may be called primordial or archetypal ideas and may, in fact, prove to be hard-wired into our psyche, stored in our DNA, or to be self-replicating by some mimetic process.

Many new ideas in science are really theories. Theories attempt to explain phenomena or make mysteries somehow comprehensible, but are based on conjecture and probably lie beyond experimental or tangible proof. Newton's theory of gravitation, Darwin's theory of evolution and Einstein's theory of relativity, while based on observational science and at least partly supported by fact, represent astonishing and unifying insights that place them in the rarified realm of new ideas. A structured theory may be called a model.

Most new ideas are really discoveries or inventions. Discoveries and inventions result from observation and experimentation, respectively and often arise from **Editor's Letter** *continued on page 10*

Editor's Letter continued from page 9

trying to solve a problem. Use of fire was probably discovered after lightning ignited a tree or a rock falling on another rock produced a spark: these were observations. Learning to produce fire was an invention and was probably successful only after considerable trial-and-error. The wheel likely was an invention that resulted from observing a rounded object—a tree limb or a rock—roll. Similarly the development of agriculture or domestication of animals probably was more of a discovery based on an observation than a truly new idea. We observed something growing that we could eat, discovered its seed, and experimented to grow the plant intentionally.

Most great scientific advances are likewise inventions or discoveries rather than new ideas. Steam rising from boiling water developed into the hypothesis that perhaps a gas was a form of matter; experimentation with fire, water and machine produced the steam engine. The train resulted from an experiment to marry the steam engine and the wheel with a modification-the track. The automobile resulted similarly from the observation that petroleum produces energy and, combined with the wheel and an engine, could result in a new invention, the car.

Discovery may be spontaneous and un-premeditated depending on the circumstance or point of view. The discovery of penicillin, for example, is commonly portrayed as a kind of accident whose significance was immediately grasped by Alexander Fleming. In fact, the development of penicillin occurred over a period of several decades, beginning with Louis Pasteur's discovery of the antibiotic properties of certain bacteria. Fleming accidentally discovered the particular strain of bacteria Penicillin but it was Howard Florey after him who finally perfected the culturing of the bacteria for medicinal application. The ability to identify and deduce new connections and patterns in nature and technology is the basis of experiment and invention. The development of new ideas is seldom an individual phenomenon but is born in the creativity of the collective ingenuity of the many.

The Origin of New Ideas

The impetus for new ideas originates in personal experience that is, above all, grounded in the moment, in the present and, for the most part, separate from the ego or the intellect. New ideas arise when the individual is ripped out of the mundane perspective of self-conscious, material reality. In this state he is somehow free to directly experience the relationship of his observations in a new way that is outside the influence of accepted thinking and judgment about how things are related or are supposed to be.

We are all familiar with this state from dreams that we remember. In dreams we experience the events and characters of our ordinary existence in a totally non-judgmental and un-intellectual way that surprises both our dreaming and subsequently awakened selves. The mundane is transformed into the mysterious and thoughts and experiences merge to form ideas that are sometimes so strange that it is hard to reconcile them with anything that comes from within ourselves. In short, we are able to expand beyond what we and others have thought or believed and open ourselves to new connections and associations.

To be sure, this is also the realm of the mystic or shaman, but it is also where I believe all new ideas and insights come from in science. This realm is embodied in all of our myths and symbolic stories. The hero invariably goes into the underworld, the forest, the labyrinth or under water, where he experiences a strange and dramatic struggle or adventure. He emerges back into ordinary reality transformed and proceeds to teach those left behind what he has learned.

Models and Problem-Solving

In its simplest form, a new idea is seeing a new pattern or relationship out of familiar observations. Scientific knowledge is based on observations of nature. From observations, scientists try to identify patterns and create generalizations to explain underlying processes. A model is a simplified view or abstraction of reality that permits a restructuring of otherwise unrelated or mundane observations into a powerful and dynamic pattern. Models commonly result in testable hypotheses and predictions.

A model can result from recognizing an assumption and then trying a different one. A good example may be found in Copernicus' model of the solar system. For centuries science and religion had viewed the solar system, and indeed the universe, as having Earth as its center; Copernicus imagined what would happen if a different assumption were made, namely that the sun was the center. This, of course, changed everything.

Deepak Chopra, a scientist, explains that most of modern science is based on the perfectly valid assumption that matter is primary and consciousness is secondary. It is, he points out, an equally valid assumption that consciousness is primary and matter is secondary. If we allow ourselves to consider that other possibility, imagine how our entire structuring of scientific reality must be re-organized!

In 1869, Dmitry Mendeleyev had despaired in his effort to discover a way to order the known elements in a meaningful and logical way. He reportedly fell asleep and in a dream saw a vision or a model of how the elements should be ordered. He awoke and wrote it down. That became the periodic table of elements and it is essentially unchanged today except for the addition of a few newly discovered elements. His accomplishment is even more remarkable because he devised the Table without knowledge of atomic structure. More than 30 years would pass before J. J.

Thomson (who discovered the electron) suggested that the electronic configuration of atoms might account for the periodicity of the elements, and more than 40 years would pass before atomic numbers were recognized as the basis for ordering the elements.

In geology, there are abundant examples of models that have resulted in profound new ways of thinking and structuring of observations. In my lifetime, for example, both plate tectonics and sequence stratigraphy have emerged as vital new models. Following the emergence of a new model, previously understood situations and observations are re-examined and often re-interpreted. Geosynclines become fore- or back-arc basins. Distributary channels become incised valleys. At first these modified interpretations may seem trivial and are commonly dismissed by skeptics as nothing new, just a new set of jargon to confuse and confound what was already perfectly clear. In time, however, familiar events and situations come to be understood differently and this results in new ideas about patterns, connectivity and opportunities. In fact, models often cause us to look for a predicted outcome where none had been sought before.

The impetus for many new models and inventions comes from problem-solving and critical thinking. When things don't work well or correctly, scientists try to identify the cause of perceived malfunction or error. Problems result when conventional or traditional ways of doing things no longer provide satisfactory results. Often application of a different model reveals the cause of the problem and solutions can be provided and tested. Has reality changed or just our perception and structuring of the observations that make up what we think of as reality?

For centuries science had good and acceptable explanations for many observed phenomena. Then Newton provided the model of physics based in part on his theory of gravitation. For centuries scientists went about re-examining and re-interpreting previously comfortable explanations in a new light. Once the world was again comfortably understood, Einstein developed new models to explain the same phenomena somewhat differently and, once again, reality needed to be re-structured to fit the new model. Reality, we find, does not change but the way the human mind structures reality does change and that makes all the difference.

Diffusion of New Ideas

Diffusion Theory deals with the manner and timing of the spread or diffusion of new ideas. Diffusion Theory is a model and, as such, explains previous observations in a new light. It happens to be the reigning model for the spread of new ideas but there are others and, in time, it will undoubtedly be replaced. The development of modern Diffusion Theory began in earnest in 1928 when a new hybrid seed corn was developed at Iowa State University**.

The new corn was better than regular corn in every way. It grew faster, produced larger corn, required less food and water and was more insect-resistant. Hybrid corn yielded about 20 percent more per acre than the open-pollinated varieties that it replaced. It was also more drought-resistant and better suited to harvesting with mechanical corn-pickers.

The sociology department at the University decided it would be interesting to track the adoption of the new hybrid seed corn by Iowa farmers. The results were published in 1943 by Bryce Ryan and Neal Gross in Rural Sociology. Ryan chose hybrid corn as the focus of investigation on social factors in economic decisions. His objective was to study how an Iowa farmer's social relationships with his neighbors influenced the individual's decision to adopt hybrid corn. Neal Gross, a graduate student in sociology, was hired as a research assistant on the hybrid corn diffusion project. Ryan and Gross selected two small Iowa communities located west of Ames, and proceeded to interview all of the farmers living there.

Over the course of the study period 1928-1941, all but two of the 259 farmers studied had adopted the new hybrid corn. When plotted cumulatively on a year-by-year basis, the adoption rate formed an S-shape curve over time. After the first five years, by 1933, only five percent of the Iowa farmers had adopted the new corn. By 1936, 40 percent had decided to adopt the hybrid corn. Then the rate of adoption leveled off as fewer and fewer farmers remained to adopt the new seed.

Farmers were assigned to categories based on when they adopted the new seed. The five segments of farmers who adopted the hybrid corn seed, or adopter categories, and their percentages relative to the study group are:
(1) innovators (5%),
(2) early adopters (10%),
(3) early majority (35%),
(4) late majority (35%), and
(5) laggards (15%).

Compared to later adopters (Early Adopters Early Majority, Late Majority, Laggards) Innovators had larger-sized farms, higher incomes, and more years of formal education. The innovators were judged to be more cosmopolitan, as measured by their number of trips to Des Moines (Iowa's largest city, located about seventy-five miles away). This first group of farmers, most importantly, had the ability to both understand and apply complex technical knowledge, and to **Editor's Letter** *continued on page 12*

***The history behind the theory of diffusion of innovations can be traced back to the beginning of the 20th century in German-Austrian and British schools of anthropology as well as French sociologist, Gabriel Tarde.*

Editor's Letter continued from page 11

cope with a high degree of uncertainty about new ideas or technology. In other words, the Innovator group was capable of making a decision based solely on information. This group also had the financial means to be able to take a risk. In this respect, the categories of adopter groups in Diffusion Theory analysis can be correlated to their financial means and tolerance to risk.

The second group, the Early Adopters, were typically respected members of the rural community and often were in dual roles as both farmers and role models in the banking, real estate, government, educational or religious institutions of the area. This group was highly successful and had the highest degree of opinion leadership and peer respect among all the categories in the Ryan and Gross study.

The third group, the Early Majority, was characterized by frequent social interaction with their peers but seldom had positions of opinion leadership. This group tended to undergo considerable deliberation in every decision.

The Late Majority group represented fully one-third of the total population studied and, while generally skeptical and cautious, was most susceptible to the influence of peer pressure. This group was often guided by economic necessity since its members were among the less financially successful in the community.

The final group, the Laggards, generally had no opinion leadership in the community, tended to be somewhat socially isolated, was suspicious of new ideas and had limited financial resources. This group is characterized by the over-my-dead-body philosophy of change.

The typical farmer moved slowly from awareness and knowledge of the innovation to adoption despite the obvious, objective advantage of the new corn over the open-pollinated variety it was adopted to replace. The innovation-decision period from first knowledge to the adoption decision averaged about nine years for all respondents in spite of the tremendously successful results of farmers who first adopted the new seed. In addition, the average respondent took three or four years after planting his first hybrid seed, usually on a small trial plot, before deciding to plant 100 percent of his corn acreage in hybrid varieties.

The critical insight in Ryan and Gross's study is that only the first group, the Innovators, based their decision to adopt the new corn on information. The middle groups of adopters decided to try the new technology based on the opinion or experience of others. The latest groups to adopt the hybrid corn seed were motivated more by momentum than information or opinion.

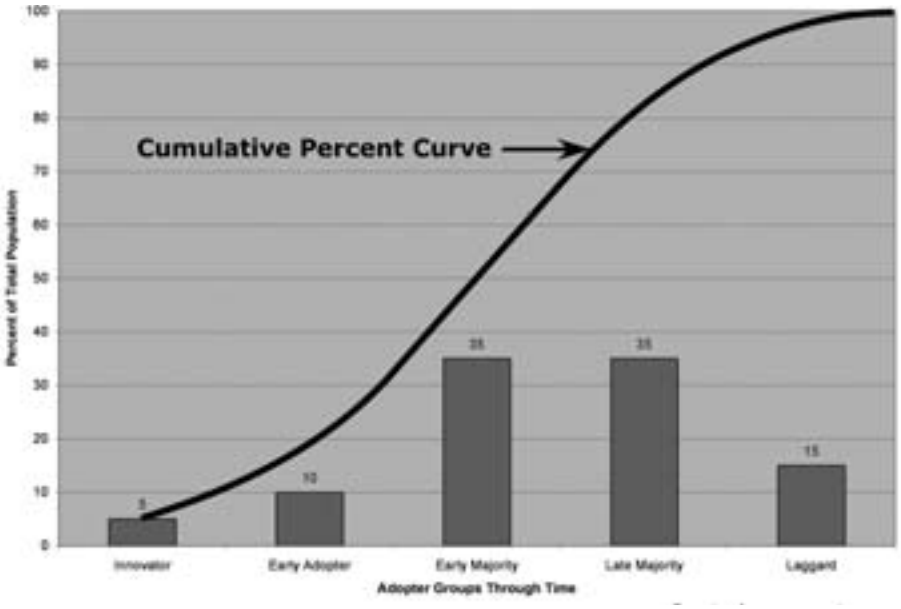

Figure 1. Percent Distribution of Diffusion Theory Adopter Groups

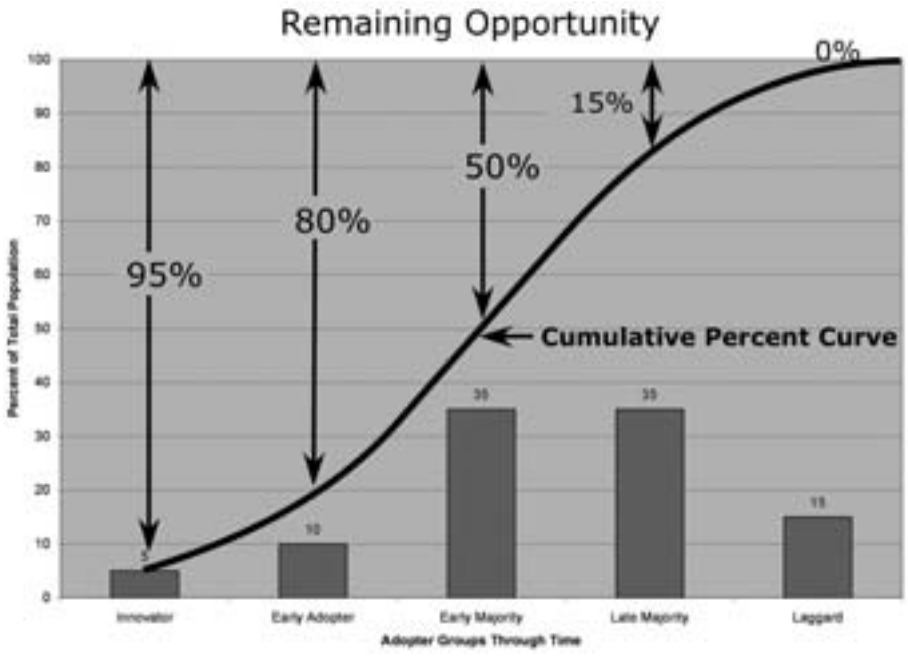

Figure 2. Cumulative Percent Distribution of Diffusion Theory Adopter Groups Showing Remaining Opportunity

Application of Diffusion Theory to the Houston Geological Society

I attended a meeting recently to discuss how advertising might be integrated between the Houston Geological Society Bulletin and the HGS Website. A number of surprising findings and observations were revealed at the meeting.

Only about 30% of HGS members have ever visited the HGS Website yet more than half (60%) of HGS event registration is done on-line. It was at first surprising to me that so few of our members visit and use the HGS Website because our membership represents a highly educated and technologically advanced group relative to the general population. There are some ambiguities in how accurately these percentages can be tracked, but they are probably accurate enough to test application of Diffusion Theory within our own organization.

There are some HGS members who do not own computers or own computers but do not use the internet or world-wide web. Clearly this group is outside the scope of Diffusion Theory analysis or is included in the Laggard Group (over-my-dead-body) of adopters for some reason.

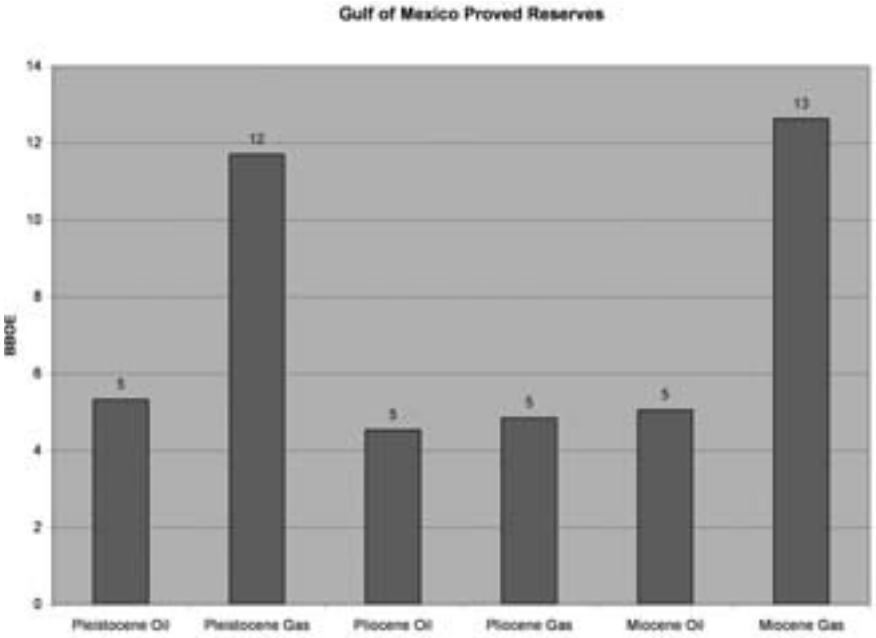

Figure 3. Proved Reserves by Play and Product Type for the Gulf of Mexico, U.S. Portion

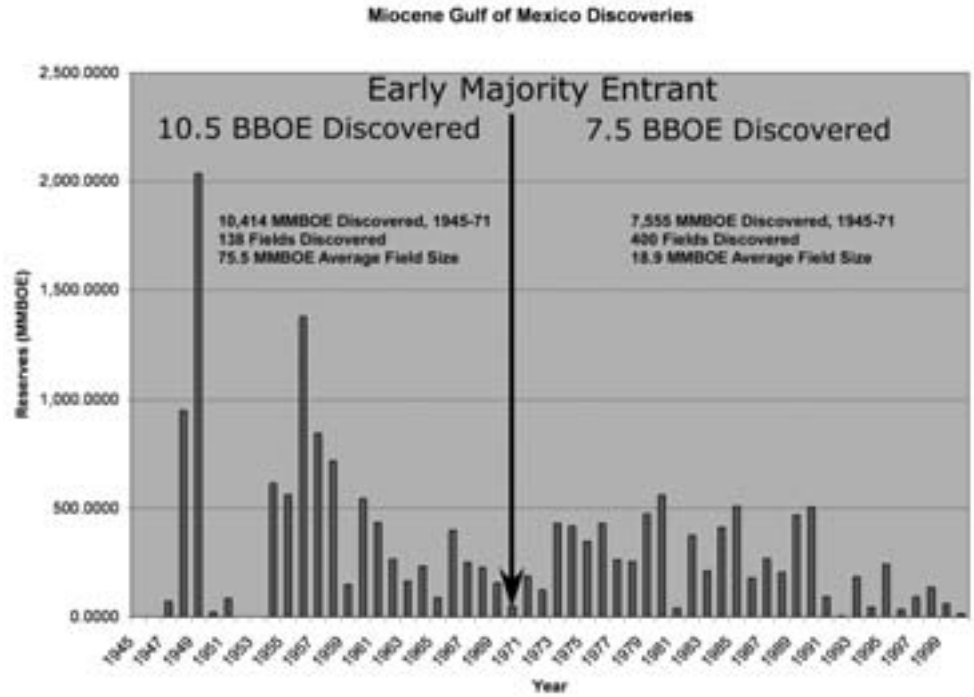

Figure 4. U. S. Gulf of Mexico Miocene Discoveries and Reserves, 1945-2000

Diffusion Theory suggests that HGS use of the Website is probably between Early Adopter and Early Majority stage. In the case of hybrid seed corn and Iowa farmers, a five- to eight-year period passed before adopter groups began experimenting with the new corn. This is consistent with the fact that the Website has existed in some form for about eight years. To carry the comparison a bit farther, we might assume that a smaller group of 5% or so of HGS members (Innovators) began visiting the HGS Website because it was a good idea and because they needed rapid access to new technologies and other information. Other current and future Website visitors decided to visit and use the Website on the basis of discussions and interaction with others who believed it was a good or interesting idea or was producing results for others.

The fact that about 60% of HGS event registration is done through the Website is surprising for two reasons: first, because the rate is nearly double the percent of HGS members who visit the Website, and second, because on-line event registration has only been available for about a year. The adoption of on-line event registration is advancing much faster than Diffusion Theory would predict.

Editor's Letter *continued on page 14*

Editor's Letter continued from page 13

HGS members who visit the Website are probably disproportionately inclined to attend HGS technical talks and other events compared to the Society's general membership.

Technical talks and symposia are vehicles for transfer of geological models. Innovators and Early Adopters in the HGS apparently seek new, complex technological information and are comfortable with the fairly high level of uncertainty that both new technical information and web-based technology involve. It is curious that only about half of those registering for HGS events on-line choose to pay on-line. This may reflect a lack of trust in the security of on-line payments though it may also reflect the risk aversion of all but the Innovator and Early Adopter groups.

The message seems clear: The Innovator and Early Adopter groups in the HGS are represented by people who actively attend technical events for the express purpose of learning about models that can be directly translated into new ideas in the basins and plays with which they are involved. These same groups are also most inclined to try new technologies such as registering for events on-line.

I propose that, while Diffusion Theory explains the population groups and relative timing of spread and adoption of new practices, the advent of web-based communication and information access may be accelerating the absolute rates of diffusion, at least in the HGS.

Applications of Diffusion Theory in Petroleum Exploration

Another way to look at Diffusion Theory distributions is to consider the percent of opportunity that remains for each successive adopter group. This approach is important, for example, in petroleum exploration where a finite, economically attractive resource is available in a given play or basin. Figure 2 shows the same percentage information presented in Figure 1 with remaining opportunity shown as the difference between the cumulative percentage and the total.

The last member of the Innovator group to enter a particular play or basin still has 95% of opportunity available whereas the last member of the Early Majority only has 50% available. One might conclude that, considering the risk avoided by an Early Majority play entrant, 50% of remaining resources is not bad.

Figure 3 shows proved reserves for the three main plays in the United States Gulf of Mexico Basin. An Early Majority entrant into the Miocene play, for instance, in the U.S. Gulf of Mexico should have half of 18 billion barrels of oil equivalent (BBOE) proved reserves, or 9 BBOE, available to him. The problem with this logic is that generally the largest fields are discovered early in the exploration history of a play.

Figure 4 tells a very different story. In the first half of the Miocene play, between 1945 and 1971, about 10.5 BBOE of proved reserves were discovered versus only about 7.5 BBOE during the period 1972-2000. If we look more closely we find that the average field size from 1945 to 1971 was 75.5 MMBOE whereas the average field size for the period 1972-2000 was only 18.9 MMBOE. To compound the problem, the average field size in 1949, the third year in which discoveries were actually made (no discoveries were reported until 1947), the average field discovered was 138 MMBOE while in 1972 the average field discovered contained only 18 MMBOE proved reserves.

While discovery rates for the Miocene play in the Gulf of Mexico are somewhat typical of basins and plays around the world, it is worth noting that the Gulf of Mexico is unique as a long-lived

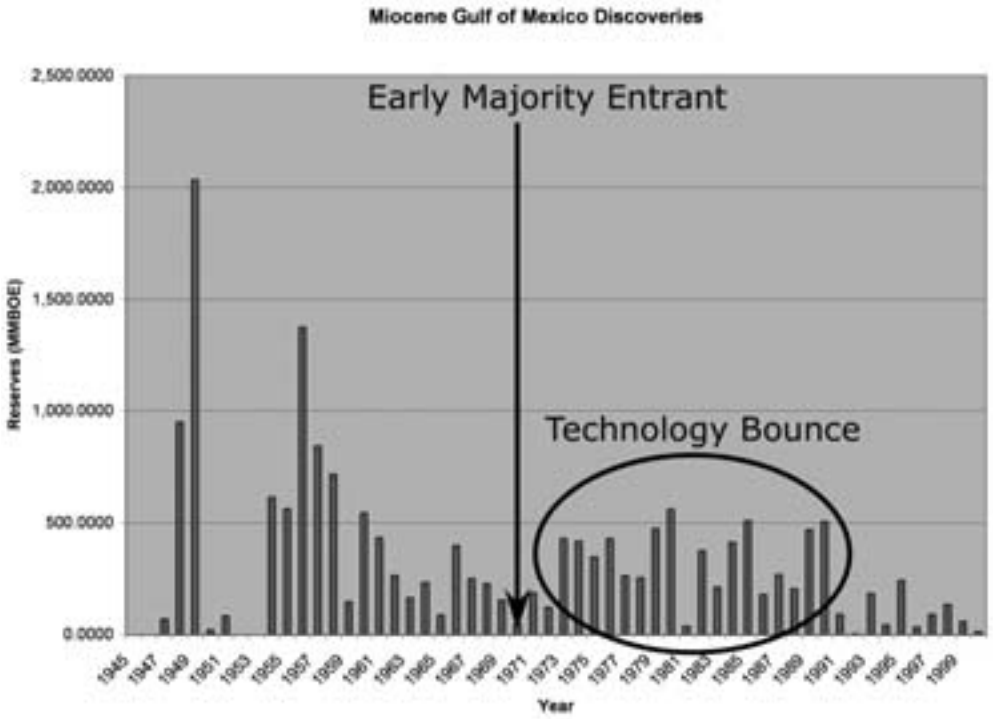

Figure 5. U. S. Gulf of Mexico Miocene Discoveries and Reserves, 1945-2000 showing affect of Technology Bounce.

prolific basin and has had a large number (at least 25) of significant discoveries (>50 MMBOE) in every year since the 1920s (Nehring, 1991). In other words, in most other basins in the world, a much smaller field size would have resulted for the same Early Majority play entrant relative to the field size available to an early entrant. On the other hand, at least in the Gulf of Mexico, other plays, notably the Pleistocene play, saw the largest field size and greatest proved reserves discovered in 1971 over the same 55 year period.

The point of the analysis is that in petroleum exploration, economic success is generally dependent on being in the Innovator or Early Adopter group of basin or play entrant groups. Those players who enter later have a large total percent of opportunity and number of barrels of oil equivalent available to them, but in much smaller field sizes and, therefore, in less economically attractive projects than the first entrants.

This, I believe, explains why, for instance, in the Deepwater Gulf of Mexico play, the early players who stayed in the play-Shell, BP, and BHP among others-dominate the play with the largest fields and the most favorable economics. Companies that entered the play in the mid-1990's were already relegated to higher risk, ultra-deep water or sub-salt opportunities, and at considerably more competitive bids than the minimum bids required for the early players to capture leases and opportunities. The companies that have entered the Deepwater play in recent years must have very different overhead structures, costs of capital or strategies in order to make money.

6,348 MMBOE	Reserves Found, 1973-91
304	Number of Fields Discovered
20.9 MMBOE	Average Field Size

Table 1. Reserves found, fields discovered and average field size, Miocene Play, Gulf of Mexico, 1973-91.

If a player wants to enter somewhat late in the exploration history of a basin or a play, he must be willing to accept smaller reserve additions with their correlative economic implications; or he must enter with a new technology to reduce risk and/or cost, a different entry strategy (e.g., acquisition) or, better yet, a new play type that effectively re-starts the clock and allows him to enter in the Innovator or Early Adapter group.

It is worth re-visiting the data from Figure 4 to examine the affect of new technology since this theme has been dominant in rejuvenating many plays and basins in recent years.

In figure 5, immediately following the year of our hypothetical Early Majority entrant, we see a "technology bounce" that persisted until 1991, most probably related to "bright spot" advances in seismic technology. It is also likely that this bounce was related to opening of new areas for leasing, advances in drilling technology and associated, improved economics. During that period nearly 334 MMBOE of new reserves were found each year, compared to a finding rate of only 119 MMBOE in the three years before (1970-72) and 93 MMBOE in the three years following (1992-94). These are the sort of results from technology that get companies very excited about renewed opportunity for economic benefit, particularly companies in the Innovator and Early Adopter groups relative to a new wave of technological advances. In other words, the Diffusion Theory clock is reset for the exploration/production play when a significant new idea or technology comes along.

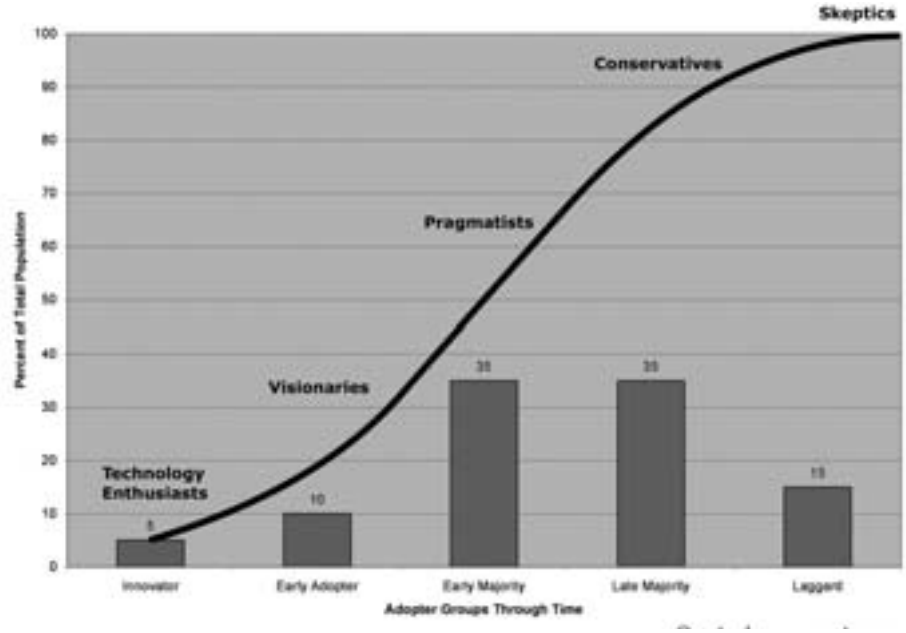

Figure 6. Diffusion Theory as a Model for the Life Cycle of a Company or Play

Unfortunately, a lot of companies had the same idea, apparently, during this period of technology bounce and, despite the impressive increase in overall proved reserves discovered, the average field size of almost 21 MMBOE was not appreciably larger than the average field size of about 19 MMBOE discovered for the entire period 1972-2000 (Table 1). Given increases in technology costs and lease bonuses that resulted from the competition and enthusiasm, it is doubtful that companies made any more profit from their efforts during the technology bounce than they would have without it!

Editor's Letter *continued on page 16*

Editor's Letter continued from page 15

It is worth noting that oil field service companies are primary change agents in the spread of new technology in the E&P area, playing a role similar to that of the University of Iowa researchers and salesmen who first promoted the new hybrid seed corn in the late 1920s. It is possible that a few Innovator companies, possibly working in concert with service companies, actually lead the new wave of technology. Additional service companies and E&P companies quickly follow in the Early Adopter and later adopter groups.

Lessons Learned and Hope For

In petroleum exploration, as in much of life, timing is everything. Because successful oil and gas exploration depends on new ideas, technology, economic analysis or concepts, it is important to have a way to assess the risks and rewards that accompany a decision to initiate or enter a play or basin. Diffusion Theory provides a relatively simple and generally applicable method to understand and calibrate exploration decisions.

There has been much attention and emphasis in recent years on risk analysis as a means to both calibrate and rank E&P portfolio opportunities and to minimize exposure to projects with a low probability of success . It is instructive to consider the way oil companies have evolved in terms of the Diffusion model. Figure 6 shows how the categories of innovator and adopter groups in Diffusion Theory may be used to track the maturity stages of an E&P company, an exploration play or even an industry.

In the early stage of a company's history, it is dominated by technology enthusiasts. In the early days of the E&P industry, at the beginning of the 20th century, oil exploration was dominated by individuals and small companies who used cable tool technology to explore for and discover petroleum. There was not a lot of science involved and the focus was on drilling and risk-taking.

Almost as soon as the viability of petroleum was shown as a major energy source with the discovery of Spindletop in 1901, visionaries such as Rockefeller stepped in to imagine and form corporations that could apply drilling and subsequent technologies to a larger scale of exploration and production. Companies like Standard Oil and Texaco were formed and flourished.

As the industry progressed, pragmatists entered the picture who believed that new technologies could be developed to reduce risk and cost. Research centers were formed by the oil corporations that developed improved technology such as rotary drilling. Service companies evolved that invented logging and geophysical technologies to reduce risk. This pragmatic stage also saw the diversification of oil companies into full-spectrum E&P organizations with up- and downstream exploration, production and marketing divisions.

The late 20th century saw conservatives begin to dominate the oil industry. The primary focus shifted from oil and gas exploration and production to shareholder value and its emphasis on quarterly satisfaction of security analysts and investors. Oil companies began to rely increasingly on acquisitions and mergers to create additional value. Research laboratories were closed and new technology became the realm of service companies. Outsourcing of other, previously core functions occurred along with outsourcing of research and development.

Risk analysis is an important component of the conservative phase of oil company evolution. Risk analysis and portfolio management presume that the petroleum can be viewed as to commodity and that, with modern technology, much of the finding cost and risk can either be removed or, at least, effectively understood and managed. The risk process is characteristic of an industry that drills very little without 3D seismic, some kind of direct hydrocarbon indicator and a probability of success greater than 50%. There are many plays where operators boast an 80% average probability of success rate.

I have never seen Diffusion Theory used as factor in risk analysis or portfolio management. In other words, all other technical risks being equal, Where are we in the diffusion and adoption cycle and does sufficient opportunity remain to justify investment in a particular play or basin?

I do not believe that the oil industry in the United States has yet entered the final stage predicted by Diffusion Theory, namely the Laggard or Skeptic phase, but I will speculate briefly on what that kind of company might look like. It would be largely a holding company that functioned principally as a bank to invest in specific plays and prospects that met certain extremely rigid, low-risk criteria. It would have almost no employees. All geoscience and engineering work would be done outside the company and would be presented in final, developed form by outside people who wanted funding for their project. These projects may have been screened by representatives of the company prior to presentation to ensure they met the standards of quality and risk that were required, though this screening would likely be done by contractors. Successful projects would be sold or otherwise monetized as quickly as appropriate returns could be achieved so the company would have almost no assets other than cash at any moment in time.

The Future of New Ideas

We live in a time where all many of the world's great conventional petroleum provinces are in or near decline. Many major oil companies have disappeared in mergers and takeovers. The most attractive recent plays are all in deep water simply because the considerable costs and risks have prevented exploration and

development in these areas until recent advances in technology make this kind of play feasible. Each of these new frontier provinces-deep water Gulf of Mexico, West Africa, Brazil and India to name a few-can be readily analyzed in terms of Diffusion Theory. Innovator, Early Adopter, Early and Late Majority and Laggard companies can be identified along with the correlative opportunity that remains to them based on the timing of their entry into the play.

We are in an age of profound conservatism among E&P companies in terms of the Diffusion Theory life cycle model I have described, and one of dwindling areas with attractive new, conventional resources of petroleum. In an era where few major oil companies still maintain research and development organizations, where will the new ideas come from that will carry the oil industry to the next phase of exploration and development? What incentive will there be for discovering new frontier exploration plays in an E&P culture that subjects all investment to stringent risk and portfolio analysis? If the Diffusion Model were included in current risk analysis, I suspect that most would conclude that it is too late for new players to enter existing plays and only appropriate for existing players to develop what has already been discovered or identified.

It is time for oil companies to consider re-inventing themselves. Diffusion Theory suggests that the current life cycle of both company evolution and exploration plays has reached an advanced stage of stagnation and morbidity. E&P companies, if they are to survive, must re-establish new ideas and the inventive people who conceive them as the core capability of their organizations. They must learn once again to take risk. The model of strategically managed oil companies has failed to find significant new reserves and it should be abandoned. Senior management must re-involve themselves in the world of technical ideas. This means they must once again evaluate and make decisions on new plays and prospects and abandon the absurd notion that they are business people who can afford to leave science to technical risk committees.

We have seen how the Innovator group from Diffusion Theory made decisions based on information and was able to take risk because of its financial position. Those with financial means and resources often propel change and new ideas. Certainly the great advances of the European Renaissance would not have been possible without wealthy patrons. In a sense, those with the financial means may be thought of as having a responsibility to nurture and advance new ideas, models, theories and inventions.

In our current paradigm of nearly $50 per barrel oil, the profits of oil companies should be, at least in part, used to propel new ideas. Instead we see cash-laden E&P companies re-purchasing their own stock instead of funding research or investing in new opportunities. The model of stock market capitalism is not serving the common good very well as oil companies abandon new thinking and technologies in favor of shareholder value. Ironically, it is more common today for state-owned, capitalistically backward E&P companies to support and promote research and development and to encourage new thinking precisely because they are not prisoners of quarterly stock prices and the opinions of security analysts.

I do not know the solution to diminishing new reserves of conventional petroleum, but without a deliberate company culture that fosters, values and rewards new scientific ideas and new thinking there will be no relief. It may be that the future of exploration lies in unconventional petroleum reserves-tar sands and gas hydrates. Whatever the answer, it will only be found with new ideas, new theories, new inventions and new discoveries. It has always been this way throughout the history of our species. ■

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Monday, December 13, 2004 International/North American Explorationists
Dinner Meeting

Westchase Hilton • 9999 Westheimer
Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 Nonmembers & Walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

by ***Dr. Lesli J. Wood***
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Quantitative Seismic Geomorphology of Clastic Reservoirs and Systems

Quantitative seismic geomorphology (QSG) is a new direction in the application of Seismic Geomorphology that will create a step-change in our knowledge, characterization and understanding of older clastic environments.

The discipline of geomorphology has a long and illustrious history. More recently tangential application of geomorphic principles to the study of stratigraphic sequences, reservoir heterogeneity and geobody formation has begun to recognize the additional insight that can be developed when we apply knowledge gained through modern geomorphic study to interpreting older strata and processes (Carter, 2003; Posamentier and Kolla, 2003; Posamentier, 2003). Evolving image technologies (3D seismic, multicomponent seismic, visualization, attribute analyses, laser outcrop imaging, etc.) now enable geoscientists to see in greater detail than ever before how seascapes and landscapes have evolved through time. There is little doubt that seismic geomorphology, when integrated with seismic and sequence stratigraphy, is a powerful tool for understanding basin evolution. However, applying geomorphic principles and laws to simply understanding the gross history of basin evolution is to only scratch the surface of what this new approach can bring to the table.

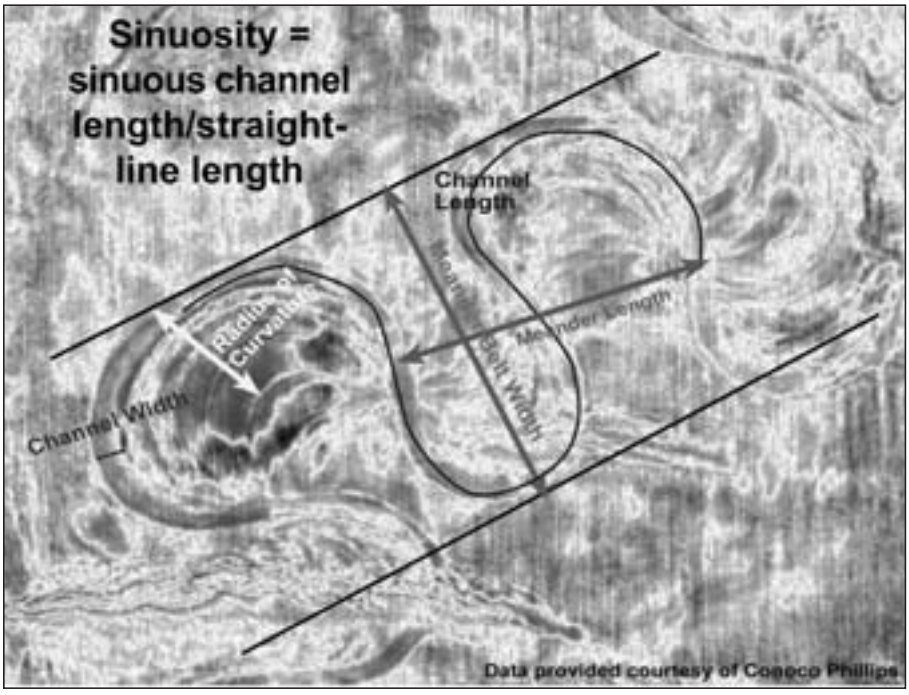

Figure 1a. Channel systems of the West Natuna Basin in Indonesia are incredibly well preserved to several seconds time depth in the seismic data and offer the opportunity to collect morphometrics to be used in exploration and in development planning.

Opportunity exists to take a more quantitative approach in the integration of geomorphology and seismic data. Quantitative seismic geomorphology (QSG) is a new direction in the application of seismic geomorphology that will create a step-change in our knowledge, characterization and understanding of older clastic environments. QSG is defined as "quantitative analysis of the landforms, imaged in 3D seismic data, for the purposes of understanding the history, processes and fill architecture of a basin" (Wood, 2003). QSG uses 3D seismic data integrated with core and logs to investigate the nature and architecture of reservoirs through quantitative data collection on the system's morphometrics and through analyses of the spatial and temporal variability of reservoirs. Several recent

International/North American Explorationists *continued on page 20*

 continued from page 19

papers, poster presentations and oral talks have discussed this approach to quantification of morphometrics in clastic reservoirs.

Case Studies

Fachmi and Wood (2003) used a large 3D mega-merge, seismic dataset in the West Natuna Basin of Indonesia to examine the paleogeomorphic evolution of the basin, to assess the impact of tectonic overprint on the character of the geomorphic systems and to create quantitative probability models for exploration and development in this complex system. The West Natuna Basin is a prolific hydrocarbon basin whose reservoirs are deltaic and fluvial. Reservoir systems are architecturally complex and incredibly well imaged in two 3D seismic volumes that have been merged to cover 3,154 km^2. Fifteen well log suites located within the study boundaries provide deterministic data on lithology. The geomorphology of the preserved channel reservoir system has been quantified by measuring channel element sinuosity, meander wavelength and radius of curvature, channel and valley width:thickness ratio, meander belt width and rates and directions of meander migration (Figure 1a). These quantitative values are used by the authors to examine the size range of reservoir elements, calculate reservoir rock volumes and ascertain drainage radius (Figure 1b).

Zeng, Wood and Hentz (2001) and Wood (2003) in a study of the northern Gulf of Mexico (Vermillion Island and South Marsh Island) shelf used 360 km^2 of 3D seismic and 155 well logging suites to examine environments that included fluvial, deltaic and shallow marine, as well as shelf-edge, slope and fan systems. Three specific fluvial incision types (creeks and distributaries, bypass fluvial systems and aggradational fluvial systems) were examined through QSG methods and found to each show unique sinuosity, channel widths, meander lengths and meander belt widths (Figure 2a and 2b). V_{shale} calculated from well data showed these channel and valley types to each be unique in their fill type, with sand:shale ratios that corresponded to mixed load, bed load and suspended load systems, as defined by Schumm (1977). These results suggest an ability to utilize seismic facies morphometrics to identify fill type within fluvial incisions, similar to techniques employed in the classification of modern fluvial systems.

Geomorphic principles of channel form versus nature are applicable not only in subaerial and deltaic fluvial systems but also in deep marine channel systems. Moscardelli, Wood and Mann (2004), and Mize and Wood (2004) working in offshore eastern Trinidad, used 8,000 plus km^2 of 3D seismic data and over 200 shallow dropcores to examine shelf-edge deltas, slope-leveed channel systems, debris

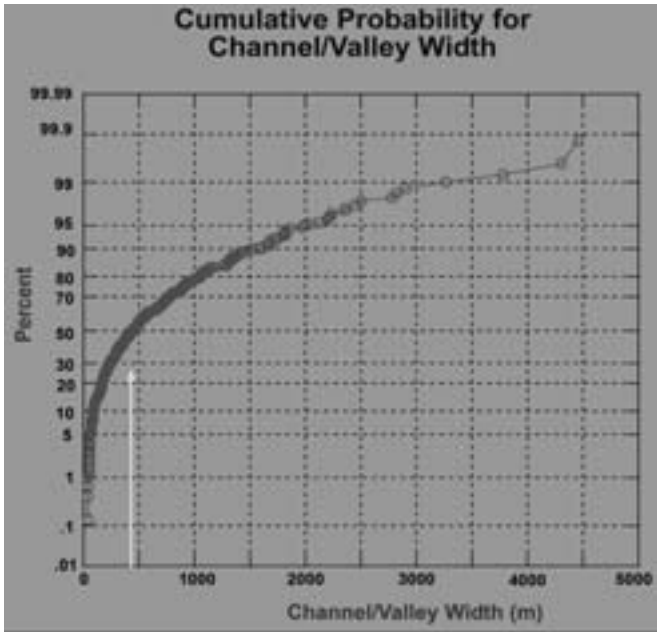

Figure 1b. Example of a cumulative probability curve of channel widths in the Pliocene of the West Natuna Basin strata in Indonesia. A P50 of 500 meters (shown by the orange arrow) can be used to predict reservoir volume, plan well spacing and build stochastic models of the reservoir system.

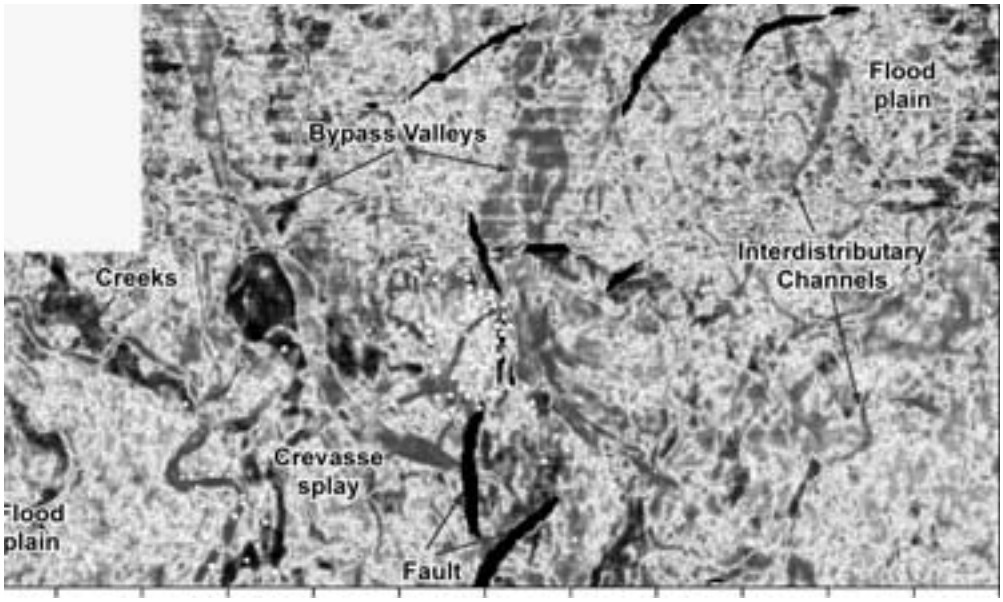

Figure 2a. Numerous channels and larger incised valleys can be found in the Pliocene and Pleistocene reservoir intervals of the northern Gulf of Mexico. Three specific classes of incised features were identified based on their distinct morphometrics. These include Bypass Valleys, Creeks and Distributary Channels and Aggradational Fluvial Systems (not shown).

flows, and associated environments and processes. The study area is characterized by right-lateral transpressional structuring along the Caribbean-South American plate margin and is a world-class mobile shale basin showing extensive development of mud diapirism, mud volcanos and mud walls (Figure 3). These variables have a significant affect on deep-marine debris flow character and distribution, as well as levee channel morphometrics, evolutionary patterns and levee character.

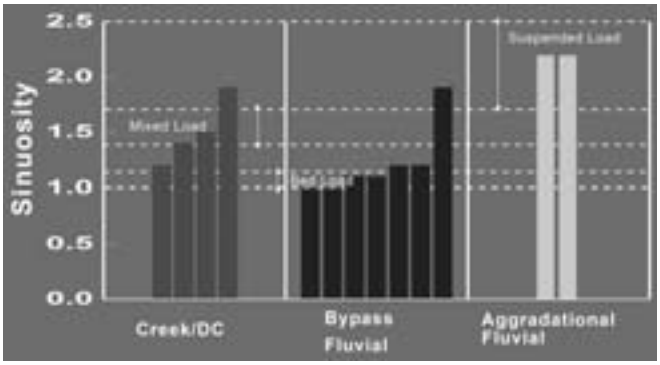

Figure 2b. Sinuosity measurements for select channels within each class show them to fall within mixed, bed and suspended load classes as defined by Schumm (1977). Sand:shale ratios of these channels calculated from log data show a strong relationship between the sinuosity and net sand within the channels.

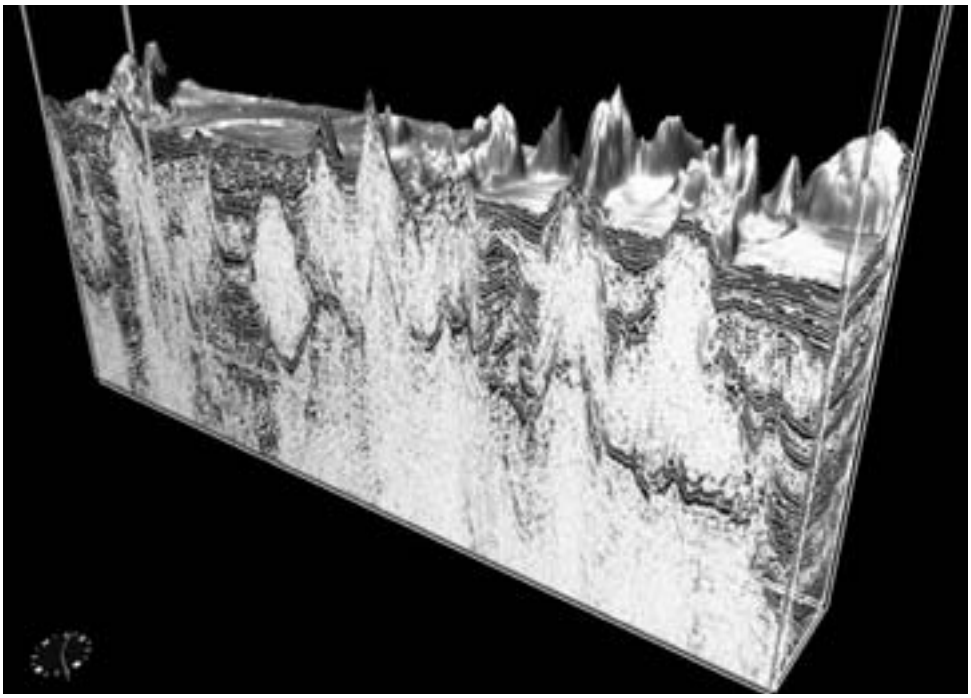

Figure 3. The southeastern Caribbean Region is one of the largest mobile shale provinces in the world with deep overpressured shales migrating to the seafloor surface along major structural discontinuities, or breaking through overburden as a result of overburden thinning and subterranean overpressuring along the crest of buried anticlines. This figure (from Sullivan and others, 2004) shows mobile shales rising as mud volcanos along the offshore extension of the Darien Ridge, the geographic northern boundary of the Columbus Basin, Trinidad and Tobago. These shales show little seismic coherency. The bottom simulating reflector illustrating the base of frozen methane (gas hydrate) can be seen as a bright reflector cutting across these diapiric features. The uplifts create topography on the modern seafloor that strongly influences sediment pathways and the nature of deep marine debris and turbidite flows.

Detailed mapping of debris flows shows significant scouring at the base of these flows and significant internal structuring resulting from internal compressive forces within the flows (Figure 4). Underfilled accommodation formed by the passing debris flow provides accommodation for later occupation by leveed channel systems. Leveed channels show significant variability in depth and sinuosity owing to local slope changes, a fact contrary to the classic proximal to distal decrease in levee heights and sinuosity seen in many systems (Figure 5). Measurements show a steady decrease in sinuosity as the systems evolves, with regions of highest sinuosity migrating in the landward direction (Figure 5). Among the many observable relationships is that between radius of curvature and meander belt width (Figure 6). This relationship is particularly important because the incised meander belt is the container and the radius of curvature is a measure of the channel reservoir extent within the "container." In addition, zones of high radius of curvature show a propensity to have more crevassing and overbank flow (Figure 7).

Probability Analyses

These types of seismically derived quantitative data provide a rich data set for development of probabilistic approaches to reservoir uncertainty. Cumulative probability curves (see Capen, 1992) can be used to illustrate the probability distribution of reservoir and seal morphologies. As an example, data collected from Pliocene-age, northern Gulf of Mexico incised channels and valleys show the channel width P50 = 840 meters, P10 = 330 meters and P90 = 1250 meters (Wood, 2003)(Figure 8). The morphometrics of modern analogs being used in reservoir assessment can be examined in the context of these quantitative seismic morphometrics to allow geoscientists to gauge the appropriateness of the analog for a specific field. For example, Figure 9 shows an 1100-meter wide channel of the Mississippi River to be at P85 for this data set. These data show that 85% of the channel widths in this Pliocene-age reservoir facies are less than 1100 meters wide. Over 20% of the widths are less than 500 meters. These data provide some sense of reason for

International/North American Explorationists *continued on page 23*

International Explorationists continued from page 21

choosing the morphometrics of reservoir bodies for reservoir rock volume calculations, development well design, correlation distances and drainage radii, as well as building reservoir models and designing field floods.

Concluding Observations

The future of seismic geomorphology will continue to grow and develop into increasingly quantitative methods as data quality and imaging and visualization techniques improve. The ability to collect large quantitative data bases from one's own reservoir interval is currently hampered only by the lack of tools in existing workstation software packages and geoscientist's limited knowledge of how those morphometrics can be used in their exploration and development process. ■

Biographical Sketch

Dr. Lesli J. Wood is a Research Scientist and Lecturer at the Bureau of Economic Geology in the University of Texas Jackson

continued on page 24

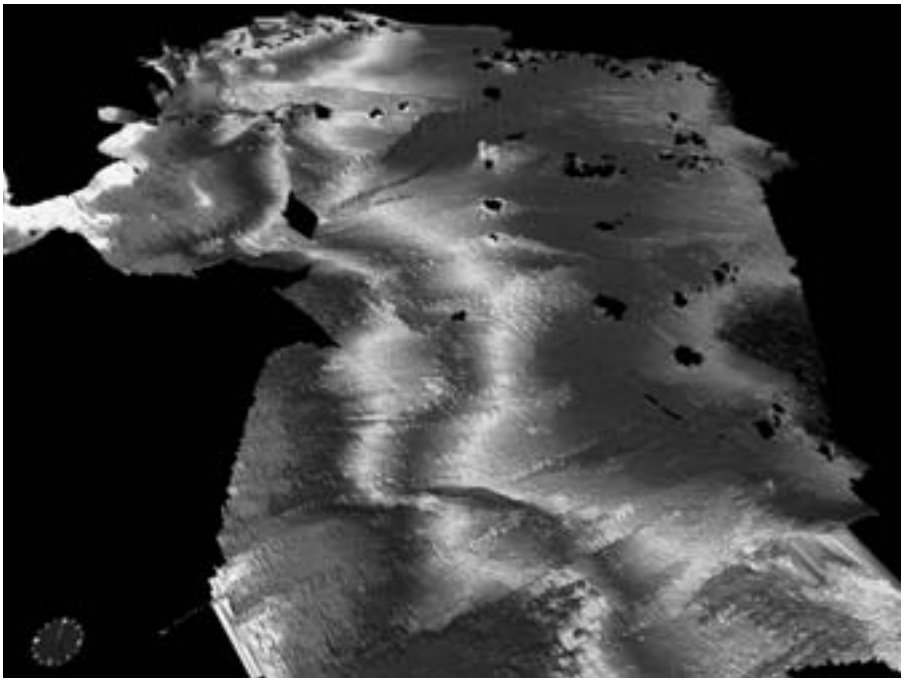

Figure 4. Basal erosional surface of the 18K debris flow in offshore eastern Trinidad. Note the northeastern orientation of the basal scours and the significant deep erosional scour in the northern half of the image. Circular black features are mud volcanoes that influence the flows trajectory during transport.

International Explorationists continued from page 23

School of Geosciences. She holds a PhD from Colorado State University (1992), an MS degree from the University of Arkansas (1988), and a BS from Arkansas Tech University (1985). Dr. Wood is the current SEPM Society for Sedimentary Geology national Secretary-Treasurer and served as the SEPM Program Committee chair for the Dallas 2004 meeting. Dr. Wood is also a member of the American Association of Petroleum Geologists, the Geological Society of America, the American Geophysical Union, and the Geological Society of Trinidad and Tobago. She spent five years in industry with Amoco Production Company before moving to the University of Texas where she directs the research group in Seismic Geomorphology. Her research interests are in outcrop characterization of clastic reservoirs, studies of worldwide large deltaic systems, quantitative seismic geomorphology, shale diapirism and mobile shale basin development, and the distribution and influence of gas hydrates on margin development. She has authored numerous papers on these subjects and presented hundreds of lectures and posters at society meetings, universities and public venues.

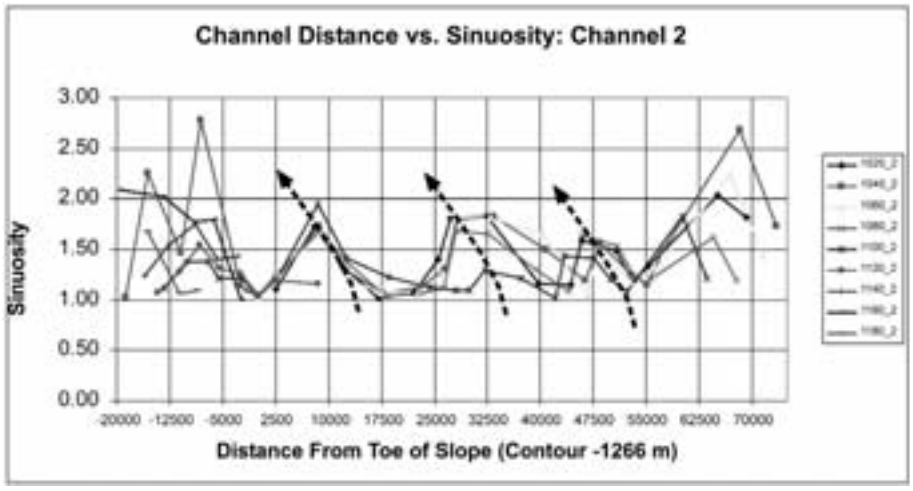

Figure 5. Deep marine channel sinuosity measured both updip and downdip from the modern toe-of-slope. Colors refer to different flattened amplitude slices from which the morphometric data was collected (i.e., 1020 = 20 milliseconds below the modern sea floor and so on). Upslope migration of high-sinuosity reaches occurs as the channel systems younger. Such behavior is contrary to published accounts from passive margin systems where high sinuosity meanders migrate in the downslope direction and is a function of the influence of local tectonics.

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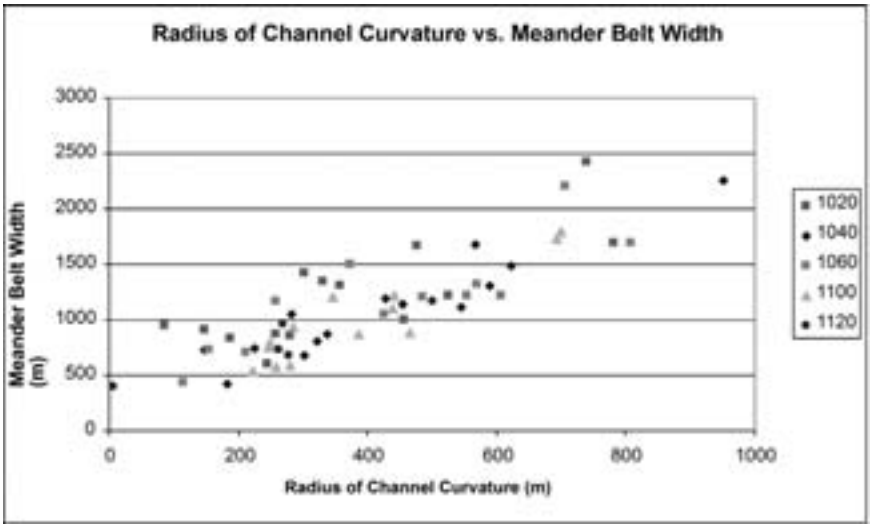

Figure 6. Meander Belt Width and Radius of Channel Curvature measurements for the Channel 2 system in offshore eastern Trinidad show a clear relationship between these two variables with meander belt widths increasing as radius of channel curvature grows.

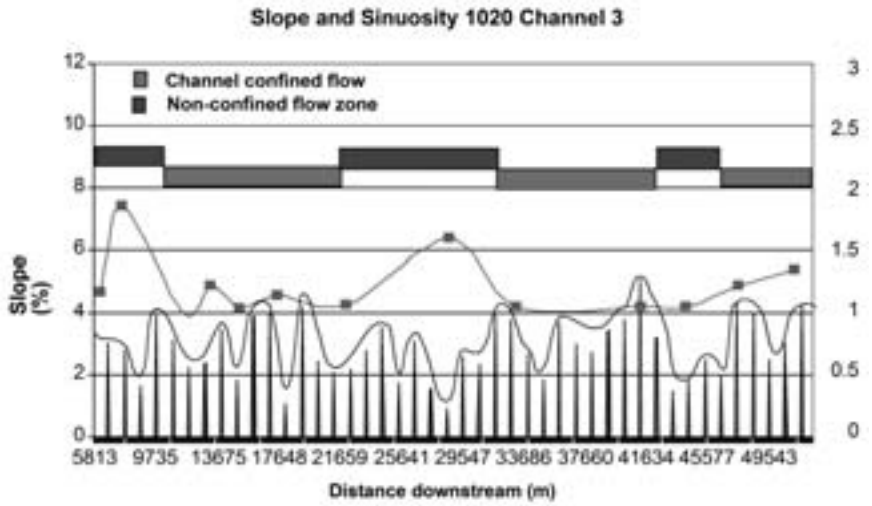

Figure 7. Channel 2 sinuosity (pink line) and averaged seafloor slope (black line) show no consistent trends from proximal (left side of graph) to distal (right side of graph). However an inverse relationship does exist between slope and sinuosity with sinuosity increasing in areas of decreasing slope and sinuosity decreasing in areas of increasing slope. As slopes become steeper, channels tend to straighten and deepen to better confine flow in high efficiency transport systems (shown in blue bars). As slopes become less step channels increase their sinuosity and shallow enabling increased overbank escape and non-channel confinement of flow. The later, shown in red bars, are areas of probably sand wave, crevasse and distributary development.

SECOND CIRCULAR
AND CALL FOR ABSTRACTS

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In Memory of Garry D. Jones
Geologic Problem Solving with Microfossils
March 6–11, 2005
Rice University, Houston, Texas USA

SPONSORS

- North American Micropaleontology Section of SEPM (host organization)
- Gulf Coast Section SEPM
- SEPM (Society for Sedimentary Geology)
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- Canadian Association of Palynologists
- Pander Society
- International Commission on Stratigraphy
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- Geology Department, Rice University

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FORUM (March 7–9)

- 2.5-day conference
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- Accepted abstracts will be grouped into appropriate themes for the Conference.

PLENARY DINNER (March 8)

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- Conference program with abstracts
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- Visit the official Conference Website beginning March 1, 2004 at **www.sepm.org/microfossils2005.htm**
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Direct all inquiries by e-mail to Thomas Demchuk (Thomas.D.Demchuk@conocophillips.com)

Microfossil images courtesy of The Natural History Museum (London), Mitch Covington, and Gulf Coast Section SEPM

Thursday, December 16, 2004

Petroleum Club • 800 Bell (downtown)
Social 11:30 a.m., Lunch 11:45 a.m.

Cost: $30 for members and affiliates pre-registered by 12 noon Tuesday 14th December (No-shows will be billed.). $35 for non-members, guests, and walk-ups.

Make reservations by telephone (713-651-1639), Fax (713-951-9659), Web-site (www.sipes-houston.org), or e-mail (bkspee@aol.com) to B. K. Starbuck-Buongiorno by 12 noon Tuesday before the meeting.

SIPES
Luncheon Meeting

*by **Allen Gilmer,***
Chairman of the Board,
Drillinginfo Inc.

The Coming Domestic Oil and Gas Boom

The United States is at a point of technical convergence and is poised to enter into a prolonged oil and gas drilling boom that could add an astounding 50 to 100 billion barrels of oil equivalent to the ONSHORE US reserve base.

Where are these "mythic" future reserves located? In large part, the resource lies in either conventional stratigraphic traps or in basin-centered reservoirs, which are beginning to look more plentiful than we first imagined. Interestingly, each reservoir type exhibits wildly different sensitivities to commodity price and different elastic behaviors to technology application. As large as that potential reserve number seems, the source is none other than the United States Geological Survey, and it is further defined to lie within undiscovered fields with 1 million barrels of oil equivalent or larger.

In large part, the resource lies in either conventional stratigraphic traps or in basin-centered reservoirs, which are beginning to look more plentiful than we first imagined.

What core technologies are contributing to the convergence? Depending on the target, either induced fracturing, horizontal drilling, rock properties-focused seismic methods or a combination thereof will hold the key. Each has exhibited moderate to spectacular results on a stand-alone basis. The Barnett Shale play owes its existence to the right frac type as determined by dozens of failed and sub-optimum experiments. Its current size is due to integrating experiments with horizontal drilling and staged fracking in the horizontal legs. Linking these two technologies have opened up a big play. Operators today are taking what they have learned in the Barnett and seeing if it works in other genetically similar plays.

What happens if we add to that the remote identification of hydrocarbon saturation and flow potential? Depending upon the major rock property factors controlling production from such reservoirs, seismically-derived information is becoming able, in more and more cases, to "close the loop" by allowing explorationists/exploitationists to invert seismic 3-D volumes to such economically-meaningful

SIPES Luncheon *continued on page 29*

Data Courtesy of VECTAENERGY CORP.

Transforming Wildcatting to Resource Harvesting

SIPES continued from page 27

volumes as "risked producible volume by well spacing unit." In other words, what the bankers and financiers really need and what they thought they were getting with 3-D zap maps in the early to mid-1990s. ■

Biographical Sketch

Allen Gilmer cofounded and is Chairman of the Board of Drillinginfo Inc in 1999. He is also the cofounder and serves on the boards of the Vecta Companies—Vecta Technology, Vecta Exploration, Vecta Energy and V-Quip, which focus respectively on multicomponent seismology research and development, oil and gas exploration and production using multicomponent seismology in the US and Canada, and multicomponent seismic field equipment.

Going out on his own in 1993, Allen discovered several oil and gas fields in Texas and New Mexico with technology-based oil and gas entities he founded and operated, such as Visos Energy Corporation, Anasazi Exploration, Inc. and Saguaro/Strata Various, a two-crew seismic acquisition/processing/interpretation company, where he learned the peculiar joys of owning minority working interest, with a wide variety of good and bad operators instead of clean, beautiful royalty interest, and of operating seismic crews, where he developed the "tooth to tattoo ratio" crew efficiency metric.

From 1987 until 1993, Allen worked for Marathon Oil Company in Geophysical Research (AVO and difficult data processing), Worldwide Seismic Acquisition, and South American Exploration. He started in the patch as a junior geologist with Range Oil in Houston, Texas, in 1984.

Allen is a Research Fellow at the Bureau of Economic Geology at UT Austin, and spends an alarming amount of money as Regional Vice President of Texas Independent Producers and Operators. He is also a Chairman's Roundtable member of the Texas Alliance of Energy Producers, Vice Chairman of the Texas Producers Advisory Group to the Petroleum Technology Transfer Council, and Lifetime Member of the SEG, AAPG, IPAMS, HGS, and IPAA.

Allen received a BA in geology from Rice University and an MS in geology with geophysics minor from the University of Texas at El Paso. He holds several patents in the field of seismology.

Tuesday, December 21, 2004

Environmental and Engineering Group Dinner Meeting

Guadalajara Hacienda Restaurant • 9799 Katy Freeway (south side of Katy Freeway between Bunker Hill and Gessner)
Social 5:30 p.m., Dinner 6:30 p.m.

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by ***John R. Larson***
TRC Environmental Corporation
Kansas City, MO

Depositional Environment Characterization for Effective Remediation

This presentation focuses on the use of a depositional model for demonstration and prediction of contributing factors for effective groundwater remediation of a chemically impacted site. Through several years of data collection, a subsurface geologic depositional model was developed to portray source area limiting factors for site restoration. The development of the model was needed to support remediation efforts that proved difficult due to complex site stratigraphy. Initial physiochemical data and aquifer fate and transport characteristics provided clues for groundwater restoration. However, discovery of unique stratigraphic variations across the site were more significant for effecting cleanup. A common approach for environmental remediation projects is the use of simple models to describe subsurface stratigraphy largely due to limited databases and lack of understanding the regional depositional history. This study demonstrates the importance of incorporating a regional geologic stratigraphic model with site hydrogeologic factors to drive successful remediation. The site-specific depositional environment model was the key tool to enhance cleanup of this chemically impacted site.

This study demonstrates the importance of incorporating a regional geologic stratigraphic model with site hydrogeologic factors to drive successful remediation. The site-specific depositional environment model was the key tool to enhance cleanup of this chemically impacted site.

Environmental geologists should use a depositional model to enhance subsurface predictions for remediation sites especially for studies that include limited local databases. As embodied in Walther's 1893 studies, "the most satisfying genetic explanations of ancient phenomena were by analogy with modern geologic processes". This study demonstrates the value of using a regional geologic analog to a site-specific depositional model to accurately portray stratigraphic factors that resulted in successful remediation. ■

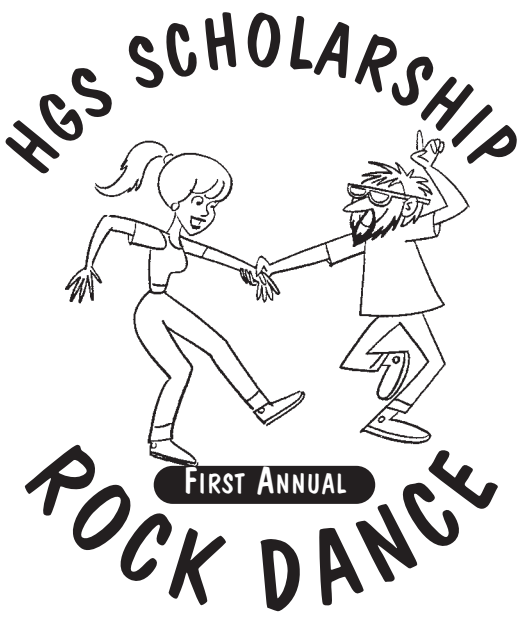
Biographical Sketch

John R. Larson (TRC Environmental Corporation, Kansas City, Missouri 64102; 816-260-6926; jrlarson@trcsolutions.com

John R. Larson is a licensed professional geologist with a Bachelor of Science in Geology from Southern Methodist University and a Masters of Public Health in Environmental Health Sciences from the University of Texas-Houston. He has published on topics that range from health effects associated with community water supplies, impacts of effluent loadings on estuarine environments, in-situ bioremediation, and most recently, on environmental justice. His expertise is providing cradle-to-grave risk management for environmental projects. Mr. Larson has delivered cost-effective risk-based closures for a diverse range of clients from electronics manufacturers, oil and gas producers and shippers, transportation carriers, and real estate developers in 21 states. Larson has also directed projects that include significant public involvement, regulatory agency interface, and legal aspects for complex development projects involving National Environmental Policy Act issues.

Prior to joining TRC in January 2004, John's career spans both industry and consulting. His previous positions are listed below:

- Assistant Vice President and Environmental Group Manager, TranSystems Corp., Kansas City, Missouri, 1999-2003
- Senior Risk Assessor, Dames & Moore, Houston, Texas, 1993-1994 and 1996-1999
- Project Manager, DuPont Environmental Remediation Services (DERS), Houston, Texas, 1994-1996
- Exploration Geologist, Marathon Oil Co. and Texas Oil and Gas Corp. (TXO), Houston, Texas, Shreveport, Louisiana, and Oklahoma City, Oklahoma, 1984-1992



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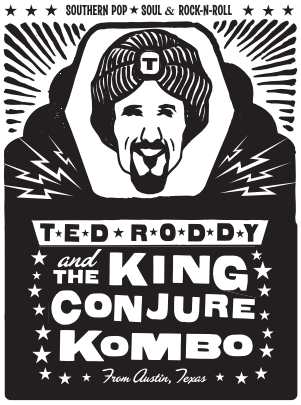


Reconnaissance in the North West Frontier Province, a Memoir of Field Work in Northern Pakistan

by ***Terri Olson***

EDITOR'S NOTE: The fieldwork portrayed here was done in 1981. Terri finished her master's degree in geology at Dartmouth the following year, and went to work for Amoco in Denver in 1982. She attended Amoco's Petrophysics School in 1988-89, subsequently specializing in reservoir characterization. She was with Amoco (and BPAmoco) until 1999, ending up working North Sea fields in Stavanger, Norway. Terri then worked for Tom Brown Inc. as a petrophysicist, from 2000 until this year, when EnCana bought Tom Brown. She now lives in Denver with her husband (geophysicist Christof Stork) and son, and does geology and petrophysics on the New Ventures team for Encana.

John Stix is not your typical field assistant. Tall, lanky, fair-skinned and sporting a modest blond afro, he stands out in a crowd of Pakistanis even more than I do, with my blonde braids and blue jeans. The most evocative story I heard about John was from his undergraduate days at Dartmouth. He was on a trip to Costa Rica for geology field camp, and the young prostitutes there were much struck by his appearance. They would reportedly run down the street after him, calling "Do it for free! Do it for free!"

As we identify key outcrops and inspect access routes, the scope of the project and vividness of the landscape both exhilarate and overwhelm me... Everywhere the struggle between uplift and erosion is visible...

We are unlikely to encounter that sort of behavior here, in the bazaars of Peshawar among the veiled Muslim female population. We are stocking up for a reconnaissance trip to my field area for thesis research in the North West Frontier Province of Pakistan, far up the Indus River. I haven't been there yet, but the strip of valley at the foot of Nanga Parbat holds a mysterious allure. Within the region designated "unmapped" on the official 1966 geologic map of Pakistan, it's the area where the Karakoram, Hindu Kush and Great Himalaya Ranges converge. What geologist wouldn't be tempted to explore such a place?

Before setting out for the wild places, we have to prepare for the rigors of the trip. Chief among these will be the repeated checking of our travel permits. The Karakorum Highway is the only access route to the rocks I plan to study. It falls under the jurisdiction of the army, which is charged with keeping it open to officials and closed to potential spies and other suspicious characters. Keeping the road physically open is no small task—army crews posted along its length are regularly required to dig it out from mudslides and remove fallen rocks. Only a few years ago the highway was closed to foreigners, so we are fortunate to be able to drive to the area I plan to study. Acquiring the necessary papers is an exercise that sheds light on the prevalent attitude toward life and work in this country. Inshallah-God willing—they will be ready tomorrow.

John has experience with the delays as well as the supply gathering. He has been working in the foothills of the Himalayas for several months. He intended to do research here for a senior thesis, but anti-American sentiment that year (manifested in the 1980 burning of the American Embassy in nearby Islamabad) made that unwise. So he is now in the country doing fieldwork for the Dartmouth Dept. of Earth Sciences following his graduation. His interest in seeing the high country, his ability to get around this exotic land and his ready sense of humor make him an ideal companion for my first trip to the field. His Urdu vocabulary is small but practical, and he has experience in mundane but essential tasks such as grocery shopping and buying gasoline. I appreciate the presence of another geologist—it's great to discuss interpretations of odd features in the rocks on the spot. The alternative, when working alone, is to record the observations and tentative interpretations for later, remote discussion. That approach is more sterile, and not as conducive to multiple working hypotheses. The presence of a tall, strong, young, confident fellow also allays most of my qualms about working in remote locations that are not far from two war zones: Afghanistan and Kashmir.

The bazaars hold a profusion of treasures and junk. The bazaars of Peshawar occupy much of the old quarter of the city and are arranged according to a rather rational whimsy, like the departments of a huge old-fashioned general store. The rock bazaar lies in a winding alley off the gold bazaar; the carpet bazaar parallels the spice bazaar. The bird bazaar has more appeal, and noise, than the meat bazaar, with its hanging carcasses of goats and other unrecognizable unfortunates. The displays in the fruit bazaar are gorgeous, with a profusion of geometrically arranged tropical fruits, apples, pomegranates and nuts.

The people you see in the bazaar dress in various regional styles. There are turbaned Afghan refugees, men of Swat in embroidered vests and hats and the occasional woman in full purdah,

Reconnaissance in the North West Frontier *continued on page 34*

Reconnaissance in the North West Frontier Province

continued from page 33

wearing a dark-colored bourkah that covers her from head to foot with only a mesh placket to see out of. Though bourkahs appear to represent more a mindset, Muslim fundamentalism, than a region.

I'm not sure which are stranger to my Western senses: the scents, the sights or the sounds in the bazaars. Sometimes a single smell is identifiable: sweet cinnamon, ripe papayas, roasted cashews, hot cooking oil, donkey dung. Street vendors sell all manner of snacks, from lamb kabobs to gooey pink candy jellies, which our American hosts in Peshawar consider an invitation to digestive disaster. The call to prayer from the neighborhood mosque competes with quavering female vocals that blare from a record stall.

The purpose of this shopping expedition is to procure the supplies and non-perishable foods that will be harder to find or more expensive in the smaller bazaars of the towns and cities nearer my study area. This is soon accomplished, with a pile of diverse purchases to augment the equipment we picked up from the storeroom on campus. I have acquired a shalwar chemise, the pajama-like outfit of embroidered tunic over loose pants, to facilitate traveling incognito should the occasion arise. I also have a pretty chaddor, a long rectangular piece of cloth to drape over my head as a partial veil. It should at least make me less conspicuous in the bazaars, though the blue jeans and hiking boots sticking out below might reveal my masquerade to the observant.

We are fortunate to have a base of operations at the National Centre of Excellence in Geology at the University of Peshawar. The head of the Centre, Rashid Tahirkeli, has long-standing ties with the chairman of our department at Dartmouth. Another Dartmouth geologist, Bob Raynolds, holds a Fullbright scholarship and teaches at the university along with his wife Mary. They both have doctoral degrees in geology—hers is from Harvard, his from Dartmouth. The Raynolds echo the hospitality of the Pathan people who inhabit this region of Pakistan. Bob appears long, lean and comfortable lounging in his native dress and hat, a sort of beret with a rolled brim. Mary is genial—young but motherly, interested in our projects and our comfort. They make us welcome in their home while we prepare for our sojourn in the field. We also get initiated in the cuisine—they have a great Pathan cook, who prepares wonderful curries, vegetable melanges and rice dishes. Not only does the jolly and rotund Sardar cook the meals, he also serves strong, sweet, milky tea at all hours, starting while we're still ensconced in our sleeping bags in the living room.

Since John and I will be doing our own cooking in the field, Mary takes me into their boxy yellow kitchen to show me what various spices look like when heaped in piles, as we will buy them in the bazaar; she suggests good combinations for curries. There is no such thing as "curry powder" here.

The Raynolds introduce us to the intricacies of oriental rugs while we wait for permits and take us to visit their merchant friend Shams in the carpet bazaar. We are welcomed with almost excessive Pathan hospitality by Shams, who is very cordial in a grand manner, as befits a Pakistani man of means. Swarthy and well-fed, Shams exudes friendly consideration in asking about our trip and plying us with tea in the back room of his shop. Then we look at carpets of all sizes and colors. We learn to look at the back of the rugs to estimate knot density, and discuss the merits of natural dyes. Carpets are just a hobby for Shams; his real business entails supplying the Afghan refugee camps through large government contracts. He signals for more refreshment, and his staff brings out snacks of water buffalo, goat meat and chapatis, the local unleavened bread. We relax on piles of Turkish, Persian and Pakistani carpets and wash down the food with yet more tea. Our host enjoys talking with Americans and makes a strong impression despite his lack of English. Shams speaks Hindko, an ancient traders' language, and broken Urdu. He and Bob can converse for hours about philosophy as well as more practical matters, despite the fact that neither has a great command of Urdu, their common language. It is clear even from this low-key encounter that contacts and relationships are critical in the world of business and government officialdom.

The next morning we go in person to check on the status of our permits. Even casual observers like me can see that Pakistani institutions owe a lot to their British predecessors. Both the architecture and the bureaucracy seem throwbacks to an earlier era. Most of the government buildings are a pale institutional green color. They are uniformly one story and have long arcades for shade along the front. The officials we meet are pleasant and profusely sorry to hear that the reason for our delayed departure

Afghan refugee in the fruit bazaar in Peshawar.

may be within their bailiwick. Eventually we talk to somebody who has the authority to do something and, miraculously, the permits are produced.

Despite the relaxed attitude of all the Pakistanis we encounter, we are able to depart in good time on the first leg of my foray into fieldwork for my own research. John is good company, recounting his experiences in the foothills and educating me about the geology of the Salt Range and the Siwaliks (massive accumulations of sediments that make up the foothills and record the history of uplift and unroofing of the mountains beyond). Inshallah, it will take us a day and a half to drive to the outcrops I've come to study.

The landscape beyond the windshield of our trusty Land Rover metamorphoses by the hour. The first stretch traverses a segment of the infamous Grand Trunk Road, the most traveled road of the subcontinent. The GT Road stretches over 1500 miles, from Calcutta in eastern India to Afghanistan. We share it with water buffalo, herds of goats, crazy taxi drivers, trucks covered in colorful murals, army convoys, and buses with animal and human passengers hanging out windows and doors and off the roof. Road signs are particularly perplexing: written Urdu resembles Arabic, and we have no hope of deciphering the meaning of the signs in cryptic script. As we pass through fields of sugar cane, we remark on the dangers that lurk there—cobras, and the poppies that constitute a major cash crop as the source of heroin.

The road begins to rise into the hill country, and soon we are passing Mardan, where in a previous era British officers' wives and families retreated from the heat of summer in the lowlands. We're lucky to be here in the springtime, a more temperate season. In the days of the Raj, the Guide Corps was headquartered in Mardan, an outpost to Peshawar where many British and Sepoy (native) regiments were based.

A nut vendor in the Peshawar bazaars.

While the mountains have been visible in the distance since we left Peshawar, they make their presence felt more as we start to ascend. The crumpling of the earth's crust that started when the Indian landmass impinged on Asia 50 million years ago is still in progress. The subcontinent pushes inexorably northward; Islamabad in Pakistan is converging on Lhasa in Tibet at the geologically breakneck rate of 5 cm/yr. The grandeur and immensity of these mountains are hard to capture in writing or even pictures. As Sara Jeannette Duncan wrote in *The Simple Adventures of a Memsahib* (1893), "When God gave men tongues, he never dreamed that they would want to talk about the Himalayas; there are consequently no words in the world to do it with."

We now join the Karakorum Highway on the banks of the Indus, often precariously perched on the wall of the gorge. A tribute to commerce, historic and modern, this more-or-less paved road was built jointly by Pakistan and China to facilitate trade between the two countries. It approximately follows the route of the ancient Silk Road that connected China to Mediterranean trading centers. As Americans unburdened by a long and complex national history, it is hard to grasp that we are following a route that has been traveled for at least 15 centuries. A very long history seems especially hard to imagine since the land becomes more desolate as we drive through progressively narrower valleys, and the arid climate dominates the landscape despite efforts to improve the land through irrigation. Why would people live here, when arable land is much more plentiful to the south? Ruined fortress towers on the passes between valleys attest that control of these lands has been contested for a long time. Even now, we are entering the Disputed Territory, governed by Pakistan but claimed by India. Kashmir is part of the same long-term dispute and lies on the opposite side of Nanga Parbat from my field area.

As we get closer to our destination, the Indus Valley gets narrower and the vegetation sparser. The scree slopes seem steeper than any reasonable angle of repose would allow. Coming around bends in the road, we encounter all kinds of obstacles: boulders, goats, gaping holes in the road, work crews. Once, seemingly in the middle of nowhere, a crowd of people appears suddenly in our path.

Now the valley opens up before us and we approach the Kohistan Island Arc complex and Chilas. Chilas is the cluster of houses and shops closest to my field area large enough to be called a town. Just beyond Chilas we see our first Chinese graffiti, inscriptions in red characters left by a Karakorum Highway construction crew.

The Kohistan Island Arc complex is what's left of a chain of volcanic islands that got caught between Asia and India during the ongoing collision of those two continents over 40 million years ago. The volcanoes themselves have been eroded away, and the

Reconnaissance in the North West Frontier *continued on page 36*

Reconnaissance in the North West Frontier Province

continued from page 35

uplifted roots are now exposed in a black and forbidding ridge-front that extends for miles. An unusual suite of ultramafic bodies along the margin of the complex contains rocks that bear names not often heard by sedimentary geologists: peridotite, lherzolite, harzburgite, ophiolite. Even the more common rock type of the complex, pyroxene granulite, reveals crystalline grandeur and iridescent patterns in thin section.

We are targeting much younger and softer rocks on this expedition, units that hold clues to mysteries of the ongoing orogeny at the northwestern syntaxis, the great bend in the trend of the Himalayan ranges. I hope to decipher the history of the rocks that make up the so-called Jaliper Sandstone—their composition, the origins of their components, the processes that brought them here, their age and burial history, the configuration of their layers. Answers to these questions will in turn contribute to the body of knowledge about the surrounding mountains. Was there a basin here that has been overridden by ranges telescoping closer along major faults? How rapidly have the mountains been rising since these new rocks were deposited? Are the grains of Jaliper sandstone similar to the sands carried by the modern Indus, which deeply dissects an amazing variety of rock types? Very little work has been done or published on the geology of this remote area.

Before these scientific questions can be addressed, we need to set up a base of operations: our field headquarters. A rest house in the village near Jaliper Sandstone outcrops offers basic amenities: shelter, cots, a toilet of sorts. Electricity is lacking—we have lanterns—as are cooking facilities, which is not a problem as long as our kerosene stove holds out. We'll be cooking outside on the porch. The accommodations prove simple but livable, despite the need to haul water from an outdoor spigot and the absence of a heater.

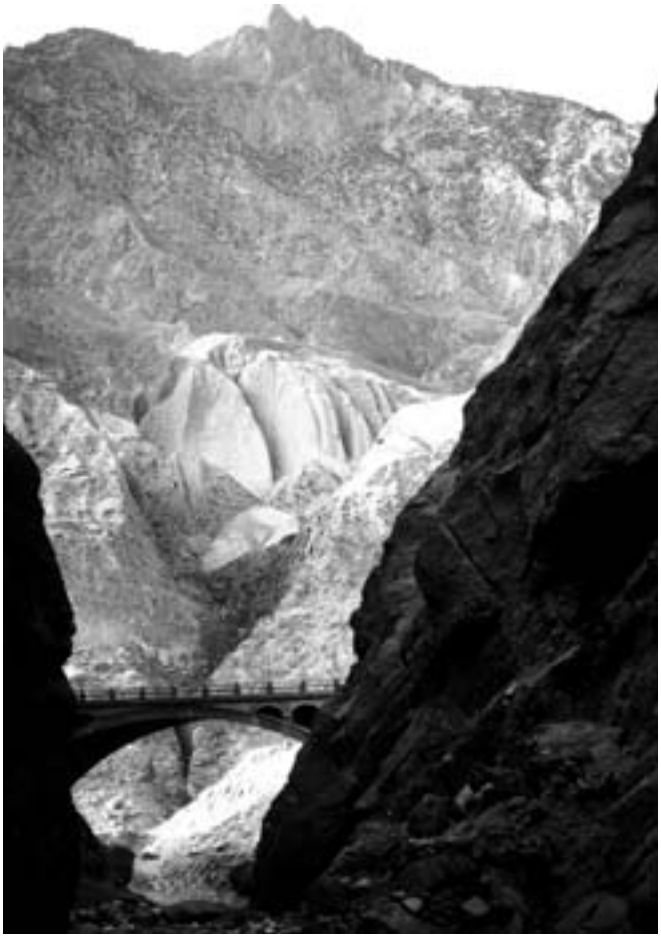
A network of rest houses provides accommodations of varying quality to diverse folks on government-sanctioned affairs, many of them bureaucrats or military men. The two-room Gunar Farm Rest House that accommodates us also hosts others passing through during our stay. From these bureaucrats we hear stories of bandits ambushing Swedish travelers in this area last year and other dangers of the road.

Once we have settled in and consumed our first homemade curry of the trip, we clear the debris from dinner and spread our maps in the hemisphere of light cast by the lantern. Getting good maps of this part of the world is impossible—those that exist are classified, due to the strategic importance of the Indus Valley. The army is present in force in the region, and not just to keep the highway open. Within the territory disputed by Pakistan and India, we are close to Russia, Afghanistan and China. Air photos are considered particularly sensitive, apparently because they show bridges and other strategic information. So we are forced to rely on old U.S. Army contour maps at a ridiculously large scale and satellite images.

Geoscientists from the Western world consider access to maps a basic right. It is difficult to document spatial relationships when you cannot pinpoint where the rocks of interest are located and where data are collected. One of the goals of this reconnaissance trip is to assess the adequacy of our maps and images for geologic mapping purposes. Global positioning systems will be a great boon to geologists and other future explorers.

A rooster reminds us at dawn that this is an agrarian area. I realize ruefully that my alarm watch probably won't be necessary here. After a quick breakfast, we willingly hit the road, eager to do some geology.

Geology requires attention to detail as well as imagination. The amazing stories that geologists construct are based on information they unearth, not merely on concepts and unbridled



View from a side valley, with sandstone fins plastered on the crystalline rocks across the main Indus valley.

imaginativeness. Geologists in training (like myself) sometimes need to be reminded to base interpretations on facts.

As we identify key outcrops and inspect access routes, the scope of the project and vividness of the landscape both exhilarate and overwhelm me. The plot of ground that contains the rocks I am investigating lies low on the northwest flank of Nanga Parbat. The Nanga Parbat/Haramosh massif occurs at a major bend in the trend of the Himalayas. The massif interrupts the course of the Indus River; the course of the river is bent to the north as it flows down from Skardu to the east; the course swings back to the south once it has crossed the massif. The northern point that defines this huge body of rock, Haramosh is visible from Gilgit and stands 7788 m (25,500 ft) high.

A visiting Pakistani graduate student for scale next to bed load of the Indus.

Two Pakistani graduate students in search of outcrops of Jalipur Sandstone.

Landscape along the Indus, with modern sediments and uplifted metamorphic rocks.

Nanga Parbat itself is the eighth highest mountain in the world, one of fourteen over 8000 meters. From the top of Nanga Parbat (8126 m, or 26,620 ft) to the level of the Indus River here near Gunar Farm (1796 m) there is a change in elevation of over 22,000 feet, about 4 vertical miles, or 6930 m. This dramatic difference occurs in a horizontal distance of about 14 miles (20 km), making it the greatest relief in the world above sea level. From here next to the Indus we can't usually see Nanga Parbat—the 15,000-foot ridges get in the way. But the landscape reflects the mountain-building forces at work. This part of the Himalayas is dominated by hard rocks—granulites, migmatites, amphibolites. Such rock types can exist in sheer cliff faces and angular configurations that would be unstable in softer aggregates. The valley segment along which the Jaliper Sandstone occurs changes from a broad valley with wide terraces at Chilas to a narrow gorge bounded by steep cliffs farther upstream. Everywhere the struggle between uplift and erosion is visible: in the deeply incised river and stream profiles, in the truck-size boulders on the riverbank, in the vertical cliff faces and oversteepened hillsides.

A critical locality for the study of the Jalipur lies across the Indus. The water is a strange milky blue-green that absorbs light, owing to the amount of glacial rock flour it carries. The river rushes by, giving the impression of great depth as well as significant width. My advisor wasn't kidding when he mentioned the possibility of employing villagers to lash goatskin bladders into a raft to ferry us across. Maybe on my next trip to the field goatskins will be necessary if no alternatives present themselves. It does not seem at all strange to consider going to great lengths to gather key information; a bit daunting maybe, but not out of the question.

From the thoroughfare along the river, the glaciers themselves are rarely visible. But they can be seen clearly on the satellite images, as interwoven linear features in glowing white with feathery edges. We hear rumors of climbing expeditions—one Japanese, one Australian—currently using the glaciers on their approach to Nanga Parbat. It was first climbed in 1953 by an Austrian named Hermann Buhl, after numerous attempts, the first being in 1895. It remains a magnet to world-class mountain climbers.

An unusually large number of possible access routes to the summit exist on Nanga Parbat—at least 7—but the unstable weather and frequency of avalanches make them all extremely dangerous. Thirty-one people perished trying to climb it prior to Buhl's success, and at least 10 since. The mountain doesn't

Reconnaissance in the North West Frontier *continued on page 39*

Reconnaissance in the North West Frontier Province

continued from page 37

discriminate; it has killed Austrians, Germans, Sherpas, Englishmen, Americans, Romanians, Gurkhas, Japanese. German climbers call it Destiny Peak.

The "Death Zone" encompasses all terrain above 5000 m; time spent at those elevations must be minimized if supplemental oxygen is not used. Buhl managed the last 1300 m alone; Reinhold Messner climbed solo in 1978, from 6000 to 8126 m, also without artificial oxygen. Messner's was the first solo ascent of any 8000 m peak in the world.

Nanga Parbat is Kashmiri for "Naked Mountain." Despite year-round snow cover, the sheer faces always have bare rock exposed. Another name for the peak is Diamir, which is from Sanskrit and means "King of the Mountains." The names of many of the mountain's features are evocative: Moor's Head, Silver Saddle, Mummery Rib (after the first climber to attempt the mountain), Rupal Flank, Diamir Face. The Rupal Face on the south side is the biggest wall in the world. Nothing would induce me to follow in the footsteps of those intrepid mountaineers—the difficulty and the danger are incredible. I find enough adventure in the valleys of this foreign place.

The mountain dominates more than the local topography. Rapid uplift of the massif affects the landforms and erosion rate—even the course of the Indus River. The rocks I have come to study would still be deeply buried, and less mangled, if it weren't for the uplift rate.

Much of the uplift is localized along fault zones. Earthquakes from fault movement occur frequently; mountain climbers have reported stupendous avalanches on Nanga Parbat that were triggered by quakes.

The Jalipur Sandstone was first described by a geologist named Peter Misch in the 1930s. Misch was a member of the scientific team that accompanied the 1934 German Expedition to climb Nanga Parbat. He characterized the Jalipur as gray sandstone with distinct layers and some pebble beds. He interpreted it as the product of glacial outwash. We discover that there is a sequence of related rocks including that sandstone, but also containing siltstone, two kinds of conglomerate and other varieties of sandstone. Even preliminary observations suggest to us that more processes than glacial stream action were involved in depositing these units. Though probably very young in geologic terms, the Jaliper rocks are extensively folded and contorted. The flat-lying sands and gravels above them are clearly different and younger still; they have not been lithified into rock.

We develop an efficient routine. Each day starts at dawn at the behest of the neighborhood rooster. We get out of our cots, fire up the stove, put water on to boil and wash up. Breakfast consists of scrambled eggs or cornflakes with reconstituted whole milk and tea. We set out in the Land Rover in search of outcrops of the

Reconnaissance in the North West Frontier continued on page 40

Tazeem Tahirkeli, geology graduate student from the University of Peshawar, with steeply dipping beds of Jalipur Sandstone.

Flame structures (soft sediment deformation) in the Jalipur Sandstone.

Reconnaissance in the North West Frontier Province

continued from page 39

Jalipur sequence. Some days we find lots of outcrops, and new kinds of rocks in the sequence. Other days we puzzle over contorted rocks, trying to work out how different rock types are related, and the age relationships. The Karakoram Highway is our main access route, but we make side forays on foot to investigate streambeds and riverbanks.

We bring along portable food for lunch—locally grown pomegranetes, nuts, dried fruit. After a break along the Indus, we resume our reconnaissance work. Each evening we concoct a curry from the produce and spices we brought to the field, a different combination every night. My favorite is a cauliflower and bean combination, with spices I mostly can't name. Turmeric I recognize and cinnamon; there's also some chipped bark and a pungent brown powder. After dinner I summarize the findings of the day, and we look at our maps and orange field notebooks to plan the next day's work.

After a week in the field, I am satisfied with our progress. We have determined the general nature of this rock sequence, located the relevant outcrops and identified the scientific and logistical problems to be solved during my main field season in the fall. We've gathered enough data and samples to make some preliminary descriptions back at Dartmouth and established the scope of the project. After we venture up a few more streambeds to verify our findings, we'll be ready to head back to Peshawar. While I will be glad to leave the eastern-style toilet behind, I am surprisingly content here after a week. I have enjoyed this time in the field, doing work I like with a good colleague, discovering new geological puzzles, being stimulated by the project and the surroundings. Eating well and experiencing good weather also contribute to my positive feelings about this reconnaissance trip.

Alif Din, police escort during my second field season, with slump feature in the Jalipur Sandstone.

The night before we intend to leave Gunar Farm, a minor rainstorm descends upon the Indus River Valley. From the rest house, amid trees and cultivated terraces, the rain seems gentle and welcome. Another story is apparent on the road. Our way out has been blocked by a debris flow. The tarmac was carried downslope, leaving a gaping ravine in its place. There will be no departure in that direction until a bulldozer can be brought in (tomorrow, inshallah).

We decide to investigate possible egress in the other direction. Maybe we can drive to Gilgit and fly out. The jeep only makes it a short distance beyond Gunar Farm to the northeast; an avalanche of mud and rocks covers the highway as far as we can see. There is no sign of the road. Since we have allowed extra time for our return trip, the comical aspect of our predicament strikes us. John ventures onto the mud to test the idea of 4-wheeling through, but the expression on his face and his rapid return on tiptoe indicate his thoughts on that subject. We marvel at the instability of the landscape. Look what happens when you add a little water! This really is a great place to study geologic processes. It's geology in action, a truly dynamic setting.

The only bulldozer in Northern Pakistan has arrived, and is working on filling in the ravine when we go to check the next morning. After about an hour of watching alongside other travelers and curious locals, enough earth has been moved to allow 4WD passage. We bump and wave, and succeed this time in starting back to Peshawar.

We retrace our route in reverse on the return trip. Nothing remarkable happens, just the usual close encounters with herds of goats, falling rocks and self-important military commandants checking permits.

We arrive in Peshawar with a day to spare before my flight back to school. Our hosts the Raynolds propose an expedition to the Khyber Pass. Bob regales us on the trip to the pass with tales of fieldwork in the surrounding tribal areas, which are effectively not under the jurisdiction of the Pakistani government. Mary tells of her struggles in trying to take female geology students from the University on field trips—they are anxious to go, and participate in the planning, but fail to appear at the appointed time. Good Muslim girls are apparently prohibited from field excursions, even with a female professor. This prohibition is implicit rather than explicit, and not absolute; one female graduate student did accompany Mary and Bob on a geological

Reconnaissance in the North West Frontier continued on page 45

December 2004

Sunday	Monday	Tuesday	Wednesday
NOW you can make your reservations on-line at www.hgs.org	**Reservations:** The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event. If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No shows will be billed.**		1 **Deep OTC "Aligning Technology with Changing Reality"** *New Orleans* November 30– December 2
5 **24th Annual GCSSEPM & Bob F. Perkins Research Conference** See page	6	7 **HGS Executive Board Meeting**	8
12	13 **General/North American/International Explorationists Dinner Meeting** by Lesli Wood, *"Quantitative Seismic Geomorphology of Clastic Reservoirs and Systems"* See page 19	14	15
19	20	21 **Environmental and Engineering Group Dinner Meeting** by John R. Larson *"Depositional Environment Characterization for Effective Remediation"* See page 31	22
26	27	28	29

GeoEvents

Thursday	Friday	Saturday
2	3	4 **24th Annual GCSSEPM & Bob F. Perkins Research Conference** See page
9 **Neo Geos Social** 5:30 p.m.	10	11
16 **HGA Social** See page 76 **SIPES Luncheon Meeting** by Allen Gilmer *"The Coming Domestic Oil and Gas Boom"* See page 27	17	18
23	24	25 *Christmas Day*
30	31	**Members Pre-registered Prices:** General Dinner Meeting . . . . . .$25 Env. & Eng. . . . . .$25 Luncheon Meeting . . . . . .$28 International Explorationists . . . . . .$25 North American Expl. . . . . .$25 Emerging Technology . . . . . .$25 Nonmembers and walk-ups. $30

Upcoming GeoEvents

February 17
HGS Rock-Based Integration
Page 58

Reconnaissance in the North West Frontier Province

continued from page 40

excursion to the Khyber Pass. That student was relatively bold and atypical—she was politically active and carried a knife in her boot, neither of which was characteristic behavior for female Pakistani university students.

Soon after we begin the gradual ascent, we encounter a camel caravan. Four camels long, the caravan is conveying household goods, including a rope-and-wood cot. Two of the camels are muzzled, a suggestive precaution. "The muzzles are in place more to prevent spitting than biting," Bob informs us.

As we wind up the narrow pass road, war relics below us evoke images of ancient and modern conflict. Huge concrete anti-tank barriers present tangible evidence of relatively recent battles. As a key access route from Afghanistan and its precursors to Pakistan and India, the Khyber Pass has been traversed by armies and hordes through the centuries. From the Aryans around 1500 BC to the British in the twentieth century, major powers of many eras have marched through the pass. Persians, Macedonians (Alexander the Great), Mongols (Ghenghis Khan) and Huns, among others, came through here.

The most powerful images to haunt me, however, derive from the massacre of nearly 16,000 British soldiers and camp followers in 1841 during their forced retreat from Kabul. This occurred during the first of three Anglo-Afghan wars, wars that pitted British interests against a perceived Russian threat in Afghanistan (part of the "Great Game"). Only about 5% of the poorly led assemblage consisted of British soldiers; perhaps a third of the column made it even as far as the pass. There was only one survivor, despite the Afghan amir's promise of safe passage. An estimated 5,000 people died here at the pass in that one atrocious event. If ever a landscape were subject to ghosts, this place would be.

Even now, the life expectancy of the local inhabitants is unnaturally short. The recent conflict in Afghanistan pitted the locals against an empire-building power, Russian this time. Most of the men we see are Muslim guerillas; many of them wear rifles over their shoulders. Mary estimates their average life expectancy to be about 40. She surmises that most Pakistani men, in contrast, will live to see their mid-seventies.

The North West Frontier Province, with Peshawar as its capital, was created by a viceroy of the British Raj, Lord Curzon, to deal with the Afghan border problem. This border area has never been a peaceful place; if no major power is trying to dominate the region, the tribes fight among themselves.

We make a brief stop at the border to goggle at the Russian sentries and the checkpoint where the few crossing vehicles swap lanes, from left (British-style) in Pakistan to right in Afghanistan. Then we head back down the pass to a smugglers' town. The atmosphere of Landi Kotal seems tinged with danger. We see many illicit substances for sale in its narrow streets: guns, electronics, even hashish. Small groups of turbaned men stand around conversing in low voices, glancing menacingly at the few foreigners. I realize why I got such suspicious looks when I mistakenly used a Russian phrase instead of a freshly acquired Urdu one a few days before.

Reconnaissance in the North West Frontier *continued on page 47*

The author above irrigated terraces in the Indus River valley, in her field area.

Member of a caravan on the Pakistani side of the Khyber Pass.

A view of the Hindu Kush from the south, on the approach to Chilas.

Mary leads us to her favorite restaurant, The Goat Bone Inn. A wicked-looking scarred fellow squats on the counter near the entrance, using the knife between his toes to slice ribs presumably from a goat. He uses his hands to pull the rack of meat toward himself through the blade, tossing disaggregated ribs onto a plate. Little effort has been expended on the décor; the cinderblock walls are unadorned except for ratty posters of competing mullahs, or are they ayatollahs? The seating consists of a motley assemblage of chairs with sagging rope seats and benches, while the tables have suffered from many knifepoints. Mary and Bob confer, apparently about the quantity to order—no menus are visible. Plates full of roasted meat soon appear, emitting a wonderful aroma. We eat local style, with our fingers, throwing the bones into the straw on the floor once they've been licked clean.

A small boy clutching a bundle of sticks steps into the doorway, staring at Mary and me. I can't tell whether it's our blonde hair or unveiled state that strikes him.

The feeling of risk combined with immersion in the unfamiliar alerts my senses and makes me feel more aware and alive than usual. Such experiences remind me why I enjoy traveling to strange and often uncomfortable places. As we walk back to the jeep I am grateful that it's daylight and I'm not alone.

So ends my first trip to Pakistan. I'm not sure the name is apt—Pakistan means "land of purity." Drugs and guerilla warfare aren't exactly pure. Nevertheless, I am not sorry to be returning in six months for a more informed look at the land and the people. ■

HGS at HGMS

Article by ***Alison Henning*** *Photos by* ***Steve Levine***

The Houston Gem and Mineral Show (HGMS) was held at the Humble Civic Center on September 24–26, providing a fabulous display of minerals, fossils, gems and jewelry. One main objective of the show is to promote earth science education in the Houston area and the importance of earth science education in general. The HGS was there in force on Friday, September 24, for Kids Day, when thousands of school children visited the show and participated in a scavenger hunt designed to expose them to the many aspects of earth science. Volunteer geologists from HGS staffed a table covered with maps, cores and fossils. The cores came from Texas and Oklahoma and represented a variety of both clastic and carbonate facies. Students, teachers and parents were all fascinated by the cores, especially the one that came from more than 2 miles below the surface! Many thanks to the Bureau of Economic Geology and Laura Zahm for providing the cores and many of the fossils for the table.

As a stop on the scavenger hunt, the HGS table was a very busy spot, continuously swamped with dozens of kids asking questions like, "What is a core?" and "What is one of the Earth's most precious natural resources?" Teachers and parents jumped right in with questions of their own. Volunteers answered questions and talked about the oil and gas industry. It was a fun but thoroughly exhausting way to share our excitement about earth science with thousands of people in a single day!

Pictures show Marsha Bourque, Laura Zahm and Alison Henning staffing the table. Other volunteers included Steve Levine, Sherrie Cronin, Janet Combes, and Martha McRae, among others. ■

AGI GOVERNMENT AFFAIRS SPECIAL UPDATE: 10-12-04

***** President Bush's Earth Science Week 2004 Message *****

The following presidential message was released by the White House in recognition of Earth Science Week 2004, which extends from October 10th to 16th. The message joins proclamations issued by numerous state governors and city mayors.

AGI thanks President Bush for this statement and thanks all the geoscientists who have organized the many Earth Science Week activities going on across the United States and around the world.

THE WHITE HOUSE
Washington

October 7, 2003

I send greetings to those celebrating Earth Science Week 2004, sponsored by the American Geological Institute.

Americans are blessed to live amid many wonders of nature. We have made remarkable progress over the years in protecting our environment and natural resources, and we must continue to conserve our national heritage through good stewardship. Earth scientists improve our understanding of the world around us and help ensure that our national treasures remain clean, safe, and a source of pride to our citizens.

This year's theme, "Living on a Restless Earth," provides an opportunity for students to learn more about our beautiful planet and how Earth scientists contribute to the health and safety of our citizens. I commend teachers, parents and all those involved in educating our children about the world around us. I also applaud those working in the Earth science field for conserving our environment and maintaining the beauty of our country for future generations.

Laura joins me in sending our best wishes.

George W. Bush

2004 Earth Science Week "Rocked"

*by **Jennifer Burton and Martha McRae,** HGS Earth Science Week 2004 Co-Chairs*

Earth Science Week co-chair Martha McRae and HGS president Steve Levine holding the mayor's official proclamation of Earth Science Week in Houston.

Almost literally we celebrated this year's national theme "Living with a Restless Earth" and it couldn't have been scripted any better to coincide with the latest rumblings from Mount St. Helens (cover) and the humbling power of Hurricane Ivan. The week started off with a "bang" at our annual Family Earth Science Festival at the Houston Museum of Natural Science on Saturday, October 9. Hundreds of families joined us by "rolling" through eight passport stations sponsored by Houston area geologic clubs. Kids from all over Houston were guided through interactive displays covering topics in paleontology, remote sensing, oily rocks and mineral identification to earn stamps on their passports and some great giveaways that included BEG rock kits, gem and mineral posters, energy activity books and colorful pens that were donated or purchased through the generosity of our corporate sponsors. The Boy Scouts also attended and earned badges for going through our passport stations.

2004 Art & Essay contest winning entries with awards. Former HGS director and ESW chair Janet Combes in background.

Our very own Steve Levine "blew" in to open the day with the mayor's proclamation of Earth Science Week and the presentation of awards to our 2004 Art & Essay contest winners. This year's contest was open to 4th grade art and 8th grade essay entries that demonstrated a creative understanding of elements of our "restless earth." We had fantastic participation with 12 metro area schools combining to submit 427 art entries and 54 essay entries. We received submissions covering the full range of earth forces including volcanoes, earthquakes, tsunamis, land-slides, hurricanes and tornados. This year's art winners were *Leslie Wiggins* (1st place, Bellville–O'Bryant); *Fernando Tejada* (2nd place, Seabrook–James Bay Elementary); and *Morgan Jones* (3rd place, Sugar Land–Highlands

Earth Science Week *continued on page 52*

Earth Science Week Volunteers

Cheryl Little	Art Browing	Tony D'Agostino	Elwin Peacock	Dan Moss
George G. Krapfel	Carrie Covarrubias	Brittany Fowlkes	Jeannie Mallick	Derek Quigley
Amy Sullivan	Christine Coelho	Cindy Krapfel	Judy Schulenberg	Don Clutterbuck
Colleen Tautfest	Edgar Covarrubias	Katie Little	Mike McCardle	Jessica Rogers
Allyson Anderson	Stan Parkins	Katy Dunbar	Pat McKinney	Karin D'Agostino
Ashling Petro - Roy	Nick D'Agostino	Leslie Busby	Ray Blackhall	Kate Carney
Chris Vandewater	Steve Schutter	Carolyn Thompson	Sally Blackhall	Kathy Ferris
Heidi Hoffower	Laurent Duchatel	Scott Singleton	Allen Mattis	Lynn Travis
Stefano Mazzoni	Jory Pacht	Elizabeth Fisher	Anita Mattis	Mike Bullen
Imelda Johnson	Nancy Englehart Moore	Steve Levine	Ashok Ghosh	Tiffany Tyler
Inda Immega	Robert Moore	Elena Arroyo	Bill Rizer	Walt Pusey
Janet Combes	Ron Waszczak	Arlene Navo	Buddy Snell	
Neal Immega	Susan Carney	Nicole Scott	Chip Carney	
Al Mowery		Brian Mallick	Dan Beaber	

Earth Science Week continued from page 51

Elementary). This year's essay winners were *Joseph Hamilton* (1st place, Conroe–Sacred Heart School); *Meagan McCormack* (2nd place, Houston–Duchesne Academy); and *Jeff Dunn* (3rd place, Conroe–Sacred Heart School). Each received a beautiful polished Brazilian agate along with a plaque bearing their names and free admission tickets to the museum. We also had honorable mentions in each catagory, *Takeru Hamnoka* (Houston–Kolter Elementary) and *Alex Diaz* (Sugar Land Middle School). Each received a coveted pair of geode bookends and admission tickets to the museum. *Way to go kids!*

We "slid" into the end of the week with our annual weekend field trips. This year, our Saturday trip descended on Huntsville to visit the Blue Lagoon quarry. This is a location with fabulous Oligocene plant fossils and is a popular scuba diving site that is rarely open to rock enthusiasts. Thanks to Janet Combes and Neal Immega we were able to secure permission for the trip. Alan Arterbury, owner of Blue Lagoon, generously reduced his admission cost and the HGS ESW committee was able to underwrite the fees to make it free for all in attendance. It was a gorgeous, warm day with a great turn-out of over 200 people. Area geology professors and geologists were on hand to describe cross-bedding, point bar formations and other fluvial processes preserved in the clean sandstone. Excellent examples of fossilized leaves and wood debris were found in abundance (pictured).

Our finale "submerged" us into an "indoor" field trip to the Landmark Graphics visualization pod. Landmark graciously donated time and staff to presenting three 45-minute sessions featuring a 3D tour of the world of seismic technology and earth modeling. Thirty-five participants were treated to a real-world example of directional drilling including the technology that goes into planning a target well.

SIPES volunteers share information on drilling and coring at "be a geo-scientist" station.

This was a fantastic "whirlwind" week thanks to the dedication of our many volunteer friends (listed below), the Houston Museum of Natural Science, and the gracious support of our corporate sponsors Anadarko, ChevronTexaco, Shell, BP, Fugro, and Landmark Graphics. ■

Scouts get a lesson in remote sensing from AWG volunteers.

HGS volunteer geologist explains petrified wood to a group of youngsters.

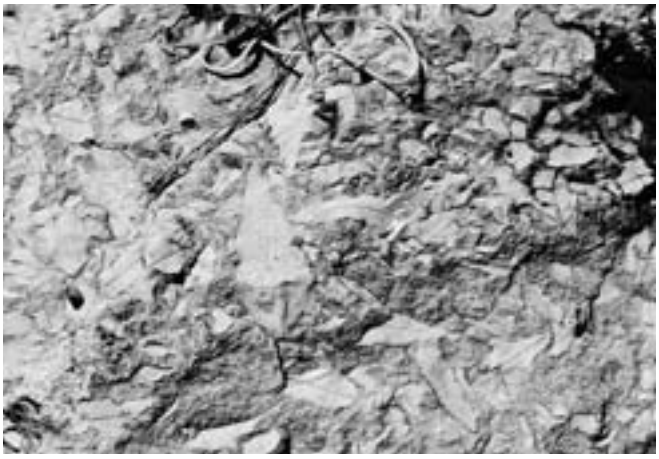
HGS volunteer geologist explains how oil gets into rocks.

Scout volunteers Katie Little, Cindy Krapfel and Katy Dunbar help direct field trip participants to parking and sign-in table.

Janet Combes of ExxonMobil gives an overview of the Blue Lagoon geology.

Bill Dupre, HGS director and UH professor discussing geology with visitors to the Blue Lagoon fieldtrip.

Volunteer Tony D'Agostino (left) shows a point bar schematic to Blue Lagoon field trip participants at the outcrop.



Leaf fossils at Blue Lagon.

Laurent Duchtal of Landmark Graphics talks to particiapants just before they enter the 3D Visulization Pod.

Writing a Novel

by ***George D. Klein,*** *SED-STRAT Geoscience Consultants, Inc*

Since publishing my novel *Dissensions*, a significant number of HGS members contacted me and asked what was involved. Queries ranged from sharing potential plots to the mechanics of publishing.

Let me share some essential steps involved. First, one needs a block of relatively uninterrupted time to write the first draft. In my case, I had major surgery and suddenly found myself with a three-month rehabilitation period when I couldn't consult, couldn't market and couldn't interview. Before going to the hospital, I came across an old file from my previous life as a university professor. I used it for the plot and wrote two-thirds of the first draft while rehabbing.

My next consultancy took me to Mexico, where I was advised not to go out at night or on weekends. I brought my laptop and finished the first draft in my hotel room on nights and weekends away from the client's office.

What emerged was an unedited manuscript of nearly 1,100 pages that needed massive revision. HGS member Hugh Hay-Roe, widely known for editing, advised me to join the Fort Bend Writer's Guild (FBWG) and attend weekly evening meetings. The meeting format was to have ten pages of one's manuscript read and critiqued. I attended when my schedule permitted and used weekends to revise that feedback. *Dissensions* went through 35 revisions before it was released for publication.

Don't expect to get rich from publishing a novel. Few authors do. It's like collecting art. Enjoy the experience and if you make more than you spend, count your blessings.

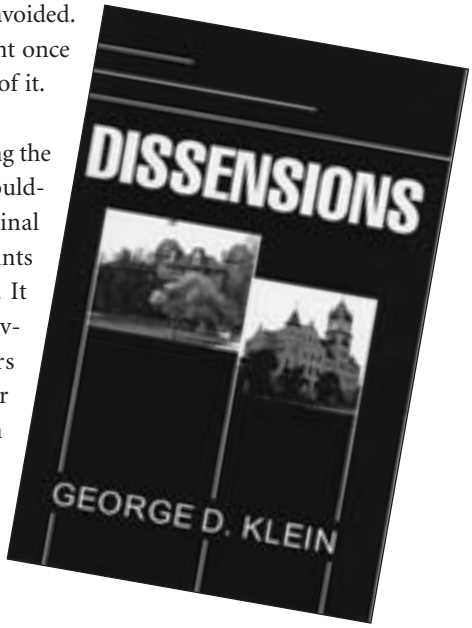
Critical issues to be addressed included the following:

- Conflict. To arouse and maintain reader interest, the critical conflict must be introduced within the first five pages of the novel. I solved that by moving a chapter from the middle of the manuscript to the first chapter. It was followed by a flashback, and then outcomes. In *Dissensions*, the principal conflict is introduced on the third page. One reader told me, "You really got right into it!" That's the whole point!

- Sex Sells! Include some to sell the book! Please use your own judgment here!

- Detail. The FBWG members said my manuscript had too much detail. I was advised to cut it out or minimize it to avoid reader boredom.

- Repetition. This must be avoided. Cross-referencing to a point once made, if critical, took care of it.



- Point of View. Who is telling the story? FBWG members couldn't figure it out. The original draft had interleaving points of view from five people. It was reduced to one by having one of the characters periodically tell the reader they got their information from certain people and having the "narrator" reappear during the story.

- Action! To maintain reader's interest, there has to be some. Action is expressed dramatically, or routinely and requires movement. In *Dissensions*, the story is told mostly through dialog. Routine actions such as drinking coffee, looking out the window or pulling out a file from a desk drawer were used to present a scenario of movement and break up lengthy dialog.

- Too Many Characters. I reduced the number by combining several into a single character and eliminating most minor characters.

- Remove Sections that Slow the Pace. If the plot's momentum slows and becomes boring, shorten (if critical) or remove that section.

- Format. The manuscript must be in 12 point Courier type, double-spaced.

The final formatted manuscript was 545 pages.

I then asked three people to review the manuscript, revised it one more time and sent it to the publisher. The folks at FBWG were surprised I arranged reviews. I explained it was standard procedure when writing papers for refereed journals and reference books, so why not with a novel. They thought it was a first, but I doubt it.

Writing a Novel *continued on page 57*

Writing a Novel continued from page 55

With the novel completed, who should publish? I learned that the chances of getting a major publishing house to accept the novel was anywhere from 1:4,000 to 1:20,000. One FBWG member disclosed it took 30 years to get his novel accepted!

The alternative is self-publishing, and thanks to the computer revolution, this option is inexpensive, and painless. Many publishing houses have subsidiaries that offer self-publishing services, and I chose Xlibris in Philadelphia, PA. After I sent them my manuscript, they copy-edited it, obtained bar codes and ISBN numbers, arranged copyright (in my name) and sent me galleys to proof. They also arranged book distribution by Ingram and by Baker and Taylor and sales through online ordering with Amazon.com, Barnes and Noble and Borders Bookstore. After several rounds of proof-reading, the book was released. I hired a local artist to design the book's cover.

Xlibris publishes strictly on a POD (print on demand) basis. Thus, the book can only be ordered online.

Marketing, if self-published, falls on the author. I sent emails to everyone I know or met during my life, including many HGS members. I have done book signings, including at HGS venues. *Dissensions* was displayed at the annual meeting of the Geological Society of America in the "Member's Corner" even though I didn't attend. I placed ads in *Geotimes*, *GSA Today* and SEPM's *The Sedimentary Record*, mailed out press releases to newspapers and NPR radio-TV stations, and circulated flyers. Several societies, including HGS and AAPG provided information in sections on Member News. So far, one newspaper and one NPR radio station (WEFT-90.1 F, Champaign, IL) interviewed me. The AAPG *Explorer* mentioned my novel in a longer article about geologists who are authors of nongeological books.

Caveat: Don't expect to get rich from publishing a novel. Few authors do. It's like collecting art. Enjoy the experience and if you make more than you spend, count your blessings.

Now, back to regular geological consulting! ■

If you want to order Dissensions, *you may email me for information. gdkgeo@earthlink.net*

HGS Shrimp Peel 2004

This year's Shrimp Peel event was held the evening of October 2 at the Sam Houston Race Park with lots of friendly folks and plenty of outstanding boiled shrimp! A disc-jockey provided a wide variety of music for all to enjoy. The quarterhorse races were exciting and several big winners could be heard after each race. The event was highlighted with 40 cool door prizes provided by our generous sponsors, making this event an extrodinary value for all who came out for the fun.

The Shrimp Peel committee thanks all our sponsors for supporting this event, with special recognition for our Gold Sponsors including: BP, Dominion E&P, Ovation Data Services, Subsurface Computer Modeling (SCM), Seismic Micro-Technology (SMT), TGS Nopec / A2D Technologies, and Veritas DGC, Inc.

See y'all again next year!!! Lee Shelton—Chairman

HGS CONTINUING EDUCATION COMMITTEE PRESENTS

Rock-Based Integration:

Geologic Interpretation of the Integration of Seismic and Petrophysical Data

by

Roger Young and Gordon Van Swearingen,
eSeis, Inc.

Thursday, February 17, 2005
8 am–5 pm
Registration Table opens at 7:30 am

BEG Houston Research Center
11611 West Little York
Houston, TX 77441
(Use Cunningham St. entrance)

Workstations allow us to display the seismic wiggle in a variety ways. The geologist's thoughts, however, may relate more to outcrops or rock samples than to strange formulations of acoustic impedance. As a result, the relationships between the physical properties (rock type, porosity, and fluids) and seismic attributes can be ambiguous, counter-intuitive, and difficult to interpret geologically.

This one-day short course demonstrates the effectiveness of "Seismic Petrophysics," a unique method that focuses on integrating ***rock-based*** information from

well logs,

seismic inversion,

AVO analysis and

seismic velocity analysis,

yielding the physical properties of: **rock type, porosity, reservoir fluids**.

REGISTRATION FORM

Rock-Based Integration:

Geologic Interpretation of the Integration of Seismic and Petrophysical Data

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Address: _____ City: _____ State: _____ Zip: _____

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Payment (USD$): _____
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Name on Card: _____ Billing Address: _____

Card Number: _____ Expiration Date: _____

Signature: _____ Date: _____ Card Holder Phone: _____

***Members: $80, if registered by Feb 11; $95 thereafter. Non-Members: $105, if registered by Feb 11; $120 thereafter**

Price includes continental breakfast, lunch, and afternoon snack.

Visit www.hgs.org for details.

* Membership prices are extended to any member of (circle one): Member Number: _____

HGS GSH API Houston HAPL SIPES Houston SPE Gulf Coast SPEE Houston SPWLA Gulf Coast

Consider $20 annual dues to join HGS and save $5 off non-member prices:

http://www.hgs.org/join_hgs/join_hgs.asp

Adventures in Paradise
AAPG Student Chapters in Indonesia

*by **Chuck Caughey,** AAPG Service Team Leader for Indonesia*

Fig. 1: Univ. Sriwijaya field exercise using seismic and surface electrical surveys to explore for buried Hindu artifacts near 9th century temples in the rain forest of South Sumatra.

AAPG Student Chapters in Indonesia put adventure into their quest for knowledge and professionalism. Exploring for 9th century Hindu relics near ancient temples in the rain forest of South Sumatra (Fig. 1) and examining carbonate environments of the beautiful "Thousand Islands" offshore from West Java are among the many activities organized by the Student Chapters to explore the diverse resources and exotic landscape of Indonesia. With more than 350 members on 11 campuses spread across the islands of Sumatra, Java and Sulawesi (Fig. 2, Table 1), the AAPG Student Chapters host geoscience activities and provide a forum for students to explore careers and learn to be professionals.

Beginnings in Bali

AAPG Student Chapters began organizing in Indonesia in preparation for the 2000 International Conference and Exhibition in Bali. This joint event of AAPG and the Indonesian Petroleum Association (IPA) generated excitement on university campuses across Indonesia and provided a major opportunity to involve students in geoscience activities.

With strong IPA/AAPG support and funding from oil and gas companies in Indonesia, a large contingent of university students and lecturers were able to participate in short courses, field trips and technical sessions at "Bali 2000." Student assistants helped with conference events from setup to teardown; this army of enthusiastic young workers was popular with conference delegates and a life saver for the organizing committee. Following this success, the IPA and other professional organizations in Indonesia adopted student assistant programs for conferences and technical meetings.

Expansion across Java to Sumatra and Sulawesi

Five AAPG Student Chapters participated in Bali 2000, all from the island of Java: Univ. Trisakti in Jakarta, Institute of Technology at Bandung, Univ. Padjadjaran in nearby Jatinangor, and Univ. Gadjah Mada and UPN "Veteran" Univ in Yogyakarta (fig. 2). These groups then began organizing their own visits by distinguished lecturers, short courses, field trips and other events. With that success, the AAPG Student Chapter program spread with new chapters forming in East Java at the Institute of Technology "Sepuluh Nopember" in Surabaya (ITS) and at Univ. Brawijaya (Malang), West Java at Univ. Indonesia (Depok, near Jakarta), on Sumatra both south (Univ. Sriwijaya, Palembang) and north (Institute of

Adventures in Paradise *continued on page 63*

Fig. 2: map of Indonesia showing location of 11 AAPG Student Chapters.

Table 1: **AAPG Student Chapters in Indonesia**

University	Location
University of Indonesia	Depok, West Java
Trisakti University	Jakarta, West Java
University of Padjadjaran	Jatinangor (Bandung), West Java
Institute of Technology at Bandung	Bandung, West Java
UPN "Veteran" University	Yogyakarta, Central Java
University of Gadjah Mada	Yogyakarta, Central Java
Institute of Technology Sepuluh Nopember (ITS)	Surabaya, East Java
University of Brawijaya	Malang, East Java
University of Hasinuddin	Makassar, South Sulawesi
University of Sriwijaya	Palembang, South Sumarta
Institute of Technology at Medan	Medan, North Sumatra

Adventures in Paradise continued from page 61

Technology in Medan), and on the island of Sulawesi (Univ. Hasanuddin, Makassar).

Each of the 11 student chapters organizes active programs of lectures, short courses, field trips, and other events. The geologic and cultural diversity of Indonesia provides an exotic setting for these activities. Univ. Sriwijaya in South Sumatra studied limnology and environmental geology at intermontaine Lake Ranau in 2003 (Fig. 3), and this year they conducted geophysical surveys in search of artifacts from the ancient Sriwijaya kingdom (Fig. 1). Students from the University of Indonesia learned to recognize reefal facies on outcrop in West Java and on seismic sections (Fig. 4) traversing recent major oil and gas discoveries. ITS (Institute of Technology at Surabaya) experimented with acquisition of seismic refraction data (Fig. 6) in East Java.

Local oil and gas operators support student visits to field operations, such as recent trips by Univ. Padjadjaran to observe oilfield and wellsite operations in central Java (Fig. 5), Univ. Hasanuddin to the EEC's Sengkang Gas Field in South Sulawesi (Fig. 6), and Univ. Padjadjaran to observe seismic acquisition in Central Java (Fig. 7).

Terima, Rima!

The Student Chapters invite participants in the AAPG Visiting Geologist Program (VGP) and they host visits by Distinguished Lecturers and officers of AAPG. Among many others, these have included a visit by former AAPG President Robbie Gries in 2001, an eight-stop tour by current AAPG Vice President Peter Lloyd in 2002, and a tour of seven universities in 7 days this year by Rima Petrossian (fig. 10), who was AAPG DEG President. Petrossian's tour was particularly important for presenting careers in environmental and ground water geology, disciplines just beginning to emerge in Indonesia. The students responded enthusiastically, and SMS messages of **Adventures in Paradise** continued on page 65

Fig. 3: Univ. Sriwijaya 2003 excursion to Lake Ranau, an intermontaine lake in South Sumatra, to make a surface electrical survey and study ground water and environmental geology.

Fig. 4: Institute of Technology at Bandung (ITB) in central Java, observing an outcrop of Miocene sandstone that produces oil nearby.

Fig. 5: Dr. Alit Ascaria (Pertamina) instructs Univ. Indonesia students about carbonate buildups on seismic sections from the Cepu area, Central Java.

Fig. 6: Institute of Technology at Surabaya (ITS) acquiring refraction seismic data with student power to hoist the "thumper" source.

Adventures in Paradise continued from page 63

Fig. 7: Univ. Hasanuddin Students with Energy Equity Personnel learning about gas production carbonate reservoirs in Sengkang Field, South Sulawesi.

Fig. 8: Univ. Padjadjaran visits Pertamina 2D seismic operations at Cirebon, in north central Java.

"Terima, Rima!" (short for terima kasih or thank you, Rima!) blossomed on my cellphone after every stop. Ms. Petrossian's marathon one week lecture tour covered 5 widely separated cities, interspersing 7 campus visits with 2 IPA luncheon talks.

Publication Pipeline brings Books to Indonesia

Two years of effort by Indonesian AAPG Student Chapters, the AAPG Publication Pipeline Committee, and IATMI (Ikatan Ahli Teknik Perminyakan Indonesia, or Indonesian Association for Petroleum Technology) culminated in delivery of 231 boxes of technical publications to Indonesian universities in May and June, 2004. This large shipment of badly needed books and journals was started by the Publication Pipeline Committee headed by Martin Cassidy and stored in a warehouse near Houston. Books on petroleum technology were then added by the Houston chapter of IATMI, who gathered funds for shipping by holding a golf tournament. IATMI organized customs clearance through the Indonesian Consul in Houston, and Schlumberger assisted with formalities upon arrival in Jakarata. Student volunteers then inventoried the books (Fig. 9) and sorted them for delivery to 15 universities in Indonesia. The resulting enrichment of technical libraries has been acclaimed by students, lecturers, and university administrators.

Outstanding Student Chapter Award

The students organized a total of 44 events over the past year, with almost 1500 participants. Most events were attended by members from several universities, and several activities drew participants from all 11 student chapters. One of these was the IPA Annual Convention, where students attended technical sessions and drew attention to their activities with a large display in the exhibition area (Fig. 10).

The Student Chapter at Univ. Hasanuddin (UnHas) in Makassar, South Sulawesi, was particularly active in 2003, with a program presenting geology to students in high schools, on-campus short courses and distinguished lecturers, and a trip to see producing operations and learn **Adventures in Paradise** continued on page 67

Fig. 9: Rima Petrossian brings environmental geology and hydrogeology to students in Yogyakarta, Central Java, one stop on her five-city tour of Indonesia.

Adventures in Paradise continued from page 65

about carbonate reservoirs at Sengkang Field (Fig. 6). UnHas encouraged participation of students from other universities in their activities, and six Univ. Trisakti students made the 900-mi. trek to join the Sengkang excursion. AAPG rewarded Univ. Hasanuddin's remarkable program with a coveted "Outstanding Student Chapter" award for 2003 (Fig. 11), consisting of a certificate and $1000.

Support from SEAPEX and Industry

An Oversight Committee of active AAPG members in Indonesia (Table 2) assists the students in raising funds and conducting events. Activities are funded by oil and gas industry sponsors and SEAPEX, the Southeast Asia Petroleum Exploration Society (Table 3). SEAPEX is an AAPG affiliated society with headquarters in Singapore and more than 500 members residing throughout SE Asia and the world. In addition to providing financial support, SEAPEX and the industry sponsors assist with campus visits by members and help in organizing activities. The IPA also helps students by assisting with logistics and providing scholarships and support for university research programs and equipment.

SEAPEX Student Leadership Conference

SEAPEX recently sponsored a special leadership conference bringing together the officers from all 11 Student Chapters for 3 days of workshops and technical presentations (Fig. 12). The conference gathered 60 student leaders at an educational facility near Jakarta to work on common problems, present their studies in poster sessions and attend short courses.

The leadership conference provided a forum to improve coordination among the chapters. Students are highly mobile, and they traveled to the conference by bus, train and air from cities as far flung as Medan (Sumatra, 900 mi. northwest) and Makassar (Sulawesi, 900 mi. east). Most of the students were able to stay several days after the conference to attend an IPA luncheon talk by Dr. Henry Posamentier on new approaches for using seismic data in exploration.

WebLinks

Students are also finalizing a website to facilitate communication and highlight activities of the Student Chapters in Indonesia, coming soon at **Adventures in Paradise** *continued on page 69*

Fig. 10: Students sorting Publication Pipeline books in Jakarta prior to their distribution to 15 universities in Indonesia.

Fig. 12: AAPG Student Members at Univ. Hasanuddin in Makassar, South Sulawesi, proudly display their AAPG Outstanding Student Chapter Award.

Fig. 11: AAPG Student Chapter Booth at 2003 Annual Convention of The Indonesian Petroleum Association (IPA), Jakarta.

Fig. 13: Advisors Chuck Caughey (ConocoPhillips, Jakarta), Aditya Syailendra (Landmark, Jakarta) and Guruh Ferdyanto (VICO, Jakarta) lead a discussion session at the SEAPEX Leadership Conference for AAPG Student Chapters in Indonesia at Depok, West Java.

Adventures in Paradise continued from page 67

www.scaapg.org. Information on the AAPG Student Chapter program worldwide is contained in the AAPG website (www.AAPG.org) which contains full information on the AAPG Student Chapter Program. There are now chapters throughout the United States and around the world. Consult the Student Chapter Newsletter at www.AAPG.org for the latest news and activities. Both the Southeast Asia Petroleum Exploration Society (www.SEAPEX.org) and Indonesian Petroleum Association (www.IPA.or.id) actively support geoscience students in Indonesia and post information on current activities on their websites. These websites are also entry points for publications of the IPA and SEAPEX, which constitute the major body of technical literature on geoscience and petroleum technology in SE Asia. ■

Table 2: **Oversight Committee for AAPG Student Chapters in Indonesia**

Active		
Chuck Caughey	ConocoPhillips	Jakarta
Eduardo Berendson	ENI	Jakarta
Frankie Sugiaman	Unocal	Jakarta
Dharmawan Samsu	BP	Jakarta
Emeritus		
James V. White	Esso Australia	Melbourne
Hasan Sidi	Fugro-Jason	Perth
Yusak H. Setiawan	Unocal	Houston

Table 3: **Sponsors of AAPG Student Chapters in Indonesia**

SEAPEX, Southeast Asia Petroleum Exploration Society
ConocoPhillips Indoneisa
Santos
Caltex
BP
CNOOC
ExxonMobil
Freeport
Amerada
Unocal

Volunteer of the Month: Allan Filipov

HGS Golf Tournament Chair

Allan Filipov has served three years as the chair of the greatly successful HGS Golf Tournament. The annual Fall tournament held in October at the Kingwood Country Club has been an HGS tradition for decades. Allan has significantly upgraded the organization of the event. The sponsors provided many smiling volunteers to make the check-in a breeze. Each of the events went smoothly, from the golf cart arrangements, post-golf BBQ dinner, leader board, to the winning prize distributions—the organization and execution seemed flawlwess. An event of this size takes an enormous amount of planning and dedication. "The golf tournament is a fun event that enables us to network and enjoy some fun time within our industry, as well as generate positive cash flow for the HGS. This event could not happen without the excellent support of the HGS office personnel as well as help from all of the golfing volunteers," says Allan.

Allan has been an HGS member since 1989. He earned a BS in geology from the University of Rhode Island in 1981. Afterwards he worked as a well logging engineer for Welex, a Halliburton Company in Kansas. He completed an MS in sedimentary geology at the University of Massachusetts in 1985. He was employed with Amoco in New Orleans from 1985 to 1989. He has been a marketing representative for various companies in Houston since 1989 and is employed with Fairfield Industries. Fairfield Industries has graciously lent his time to aid our society.

Allan Filipov's enjoyment of golf has allowed for a great addition to the HGS.

HGS Welcomes New Members

Effective October 1, 2004

ACTIVE MEMBERS
Karl Baltz
Barry Barrilleaux
Lou Bertoli
Cary Brock
William Cook
John Feitshans
Michael Folger
Frederick Haizlip
William Hottman
Michael Miller
Roger Murray
Patrick Ng
Stephen Pollard
Jeffery Reagan
Martin Rothenberg
Rene Thibodeaux
Craig Tilley
Donal Whitley
Philip Work
Gary Yoder
Robert Young
Richard Parker
Wayne Rea, II
Steven Douglass
Gregg Blake
Russell Anderwald
E. Lyendecker
Stephen Paine
Juan Muniz
Paul Younger
Giorgio Cavanna
Domenic Mancuso
Jeffery Osborn
Matthew Campbell
Tania Campbell
John Leone, Jr.
Bennetta Schmidt
Judy Schulenberg
Christopher Morto
Weixin Xu
Norman Gearhart
Arif Kemal
Jennifer Loos
Barry McBride
Ryan Krueger
Daniel Steward
Julie Pechacek
Donald Maddox
Gary Ford
Daniel Orange
Douglas Draves
Philip Lowry
Paul McPhillimy
Edward Hohos
Jared Durst

Welcome New Members

Remembrances

Since the last report from the Remembrances Committee (05/10/04), our geological community has lost the following members:

Sylvester Quinn "Skip" Breard, Jr. died August 23, 2004, at the age of 51. Skip earned a B.S. in Geology in 1975 and a M.S. in Paleontology in 1978 , both from the University of Louisiana-Monroe. He also served as an adjunct professor in the Geosciences Department of ULM. During his career, Skip worked for Amoco Production, BP, and Paleo Control, Inc. In 1992 he co-founded Applied Biostratigraphix. In addition to active membership in HGS and AAPG, Skip was past president of the Houston Gem & Mineral Society, Paleo Section. A donation will be made to the Katie Breard Scholarship Fund, c/o Bank of America Westchase.

Michael Dean Hatley died June 26, 2004, at the age of 50. Michael earned a B.S. in Geology in 1976 from East Texas State and a M.S. in Geology in 1979 from the University of Texas at Arlington. Michael was employed as a Geological Engineer with Citation Oil and Gas and was an active membership of the HGS. A donation will be made to the Michael Hatley Childrens' Education Fund, c/o Wells Fargo.

Alfred Joseph Deschamps died October 8, 2004, at the age of 81. Alfred earned a B.S. in Geology in 1950 from Berea College (Kentucky) and a M.S. in Geology in 1954 from the University of Kentucky. He was a retired geologist and an active member of the HGS as well as a WWII Navy Veteran. A donation will be made to the Clay Road Baptist School.

Thomas Davis Mooney died February 23, 2004 at the age of 67. Tom earned a B.S. in Geology in 1959 and a M.S. in Geology in 1960 from the University of Arkansas. Tom's career spanned over 40 years including positions with Sinclair Oil, Continental Oil, Inexco Oil, Aminoil USA, Centura/Minden Oil & Gas, and most recently, Ryder Scott. He was a member of HGS, AAPG, and WTGS. A donation will be made to the HGS Undergraduate Scholarship Fund.

Michel T. Halbouty, world-renowned Geologist and Petroleum Engineer, died November 6, 2004, at the age of 95. Michel was a graduate of Texas A&M University, earning a B.S. in Geology in 1930, a M.S. in Petroleum Engineering in 1931, and a PhD. in Geological Engineering in 1956. Michel's career spanned over seven decades beginning with the Yount-Lee Oil Company in Beaumont in 1931. During WWII he rose to the rank of Lt. Colonel, serving on the Army-Navy Petroleum Board. Michel's professional contributions are legendary, including honorary memberships in the HGS, GSH, AAPG (President - 1966-67), and SPE. A donation will be made to the Texas Heart Institute.

Geneos Pete "Genel" Cokinos died November 7, 2004, at the age of 88. Genel graduated from Texas A&M University in 1938 with a B.S. in Petroleum Engineering. He worked for the Texas Railroad Commission as a petroleum engineer from 1940 to 1960, interrupted by WWII when he served his country in the US Army Air Force. In 1960 he became an independent oil operator and producer in South Louisiana and the Upper Gulf Coast of Texas. Genel was a member of the HGS (Emeritus), AAPG, SPE, and TIPRO. A donation will be made to the St. George Greek Orthodox Church of Port Arthur.

2nd Annual AAPG Winter Education Conference

HOUSTON Feb. 14-18, 2005

Courses include:

- Reservoir Engineering for Geologists
- Geochemical Exploration
- Tight Gas Sands
- Risk Analysis for Development Applications
- Giant Oil and Gas Fields
- Well Log Analysis
- Assessment, Classification & Reporting of Reserves
- Practical Salt Tectonics
- Essentials of Subsurface Mapping
- Permeability in Carbonate Rocks

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email: educate@aapg.org - Register Online at: http://www.aapg.org/education

Government Update

*by **Henry M. Wise, P.G.** and **Arlin Howles, P.G.***

From the Texas Register

The Railroad Commission has adopted changes relating to the following Railroad Commission forms:

- Form W-1X: Application for Future Re-entry of Inactive Well Bore
- Form P-13: Application of Landowner to Condition an Abandoned Well for Fresh Water Production
- Form W-1: Application to Drill, Recomplete or Re-Enter

For more information go to http://www.sos.state.tx.us/texreg/sos/adopted/16.ECONOMIC%20REGULATION.html#184

Texas Commission on Environmental Quality Update

The TCEQ's Municipal Setting Designation (MSD) Application Form is now available. To download the application, go to http://www.tnrcc.state.tx.us/permitting/msd.html

House Bill 1366 (http://www.capitol.state.tx.us/cgi-bin/tlo/textframe.cmd?LEG=78&SESS=R&CHAMBER=H&BILLTYPE=B&BILLSUFFIX=01366&VERSION=5&TYPE=B) created a fund to perform corrective action at dry cleaning sites. It is similar to the petroleum storage tank fund that was established many years ago. For more information on who's eligible, etc., go to http://www.tnrcc.state.tx.us/permitting/remed/dry_cleaners/dc_fund.html

A new Web page has been added to the TCEQ Dry Cleaner Website to answer the following questions about the Dry Cleaning Facility Release Fund:

- Who is eligible for cleanup using the fund?
- Who is not eligible for cleanup using the fund?
- How do I apply for ranking and cleanup?
- What are the fund sources?
- How may the fund be used?
- How may the fund not be used?

The Dry Cleaning Facility Release Fund web page also includes the Ranking Application in three different formats. The Ranking Application is at http://www.tnrcc.state.tx.us/permitting/remed/dry_cleaners/dc_fund.html

The Dry Cleaner website is located at: http://www.tceq.state.tx.us/permitting/remed/dry_cleaners/
If you have any questions or comments pertaining to the Dry Cleaner program, please call the Dry Cleaner Hotline at 512-239-1011 or email the TCEQ at dryclnrs@tceq.state.tx.us

Texas Professional Geologist Board News

Those of us who did not get grandfathered into the Professional Geoscientist license will need to take the ASBOG exam. According to Marty Denman, Director of Human Resources with the TBPG, the ASBOG exam is given in two parts. The first part, which covers general geology subjects, can be taken at any time. That means that people coming out of college should take this part immediately, before they have a chance to forget most of it. Once passed, teh first part of the exam is good forever. There is no expiration date after which you'd have to take it again. The second part, the practical aspects of geology, is taken when you're ready to get your PG (after five years of experience).

Other things on the TBPG's agenda are continuing education and the formation of a Geologist In Training (GIT) designation, similar to the engineer in training for the PE license.

Tony Blair to Make Climate Change a Top Priority for 2005 G8

On September 14, British Prime Minister Tony Blair announced that global warming will head next year's agenda for the Group of Eight (G8) summit. He is seeking to re-engage the United States on the issue as well as promote sustainable development strategies for modernizing countries such as China and India.

As China and India modernize, their collective population of 2.3 billion people will require the most new energy in the next century. Mr. Blair believes there is a need for a G8 blueprint to guide sustainable development in these **Government Update** *continued on page 77*

GCAGS 2005 new orleans
Gulf Coast GEOLOGICAL GUMBO "a recipe for success"

GULF COAST ASSOCIATION OF GEOLOGICAL SOCIETIES
GULF COAST SECTION OF SEPM

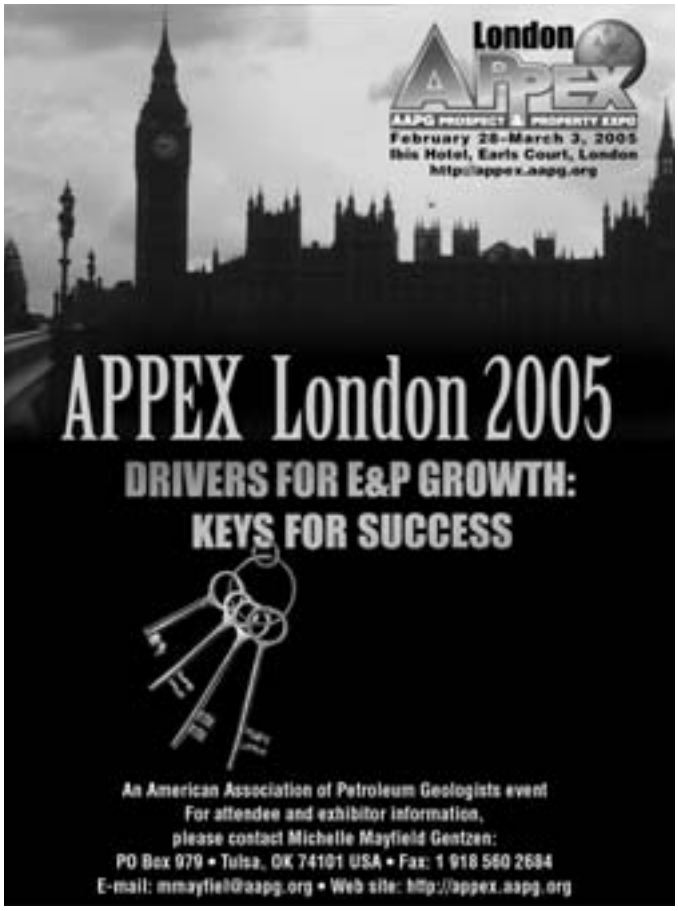
CALL FOR PAPERS

55th ANNUAL CONVENTION
NEW ORLEANS, LA
HOSTED BY THE NEW ORLEANS GEOLOGICAL SOCIETY
September 25th – 27th, 2005

HOW AND WHEN TO SUBMIT

Abstracts of all proposed presentations must be submitted in standard format (250 words or less, no figures) by January 17, 2005. Oral, poster, visualization, or core presentations will be accepted. Authors will be notified of acceptance on February 20, 2005. All presenters must submit a paper of < 11 pages or an extended abstract with key figures of ~2-4 pages by April 10, 2005. These will be published in the Transactions. Instructions and a template will be posted on the GCAGS2005 website. ABSTRACT DEADLINE: JANUARY 17, 2005! Questions should be directed to Mike Ledet at abstracts@gcags2005.com.

www.gcags2005.com



United States Postal Service
Statement of Ownership, Management, and Circulation

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Managing Editor (Name and complete mailing address)
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The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
☐ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)

PS Form **3526**, October 1999 (See Instructions on Reverse)

13. Publication Title: Houston Geological Society Bulletin
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a. Total Number of Copies (Net press run)			4334	4170
b. Paid and/or Requested Circulation	(1)	Paid/Requested Outside-County Mail Subscriptions Stated on Form 3541. (Include advertiser's proof and exchange copies)	1451	1469
	(2)	Paid In-County Subscriptions Stated on Form 3541 (Include advertiser's proof and exchange copies)	2783	2651
	(3)	Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution	0	0
	(4)	Other Classes Mailed Through the USPS	0	0
c. Total Paid and/or Requested Circulation (Sum of 15b. (1), (2),(3),and (4))			4234	4120
d. Free Distribution by Mail (Samples, complimentary, and other free)	(1)	Outside-County as Stated on Form 3541	15	10
	(2)	In-County as Stated on Form 3541	15	5
	(3)	Other Classes Mailed Through the USPS	0	0
e. Free Distribution Outside the Mail (Carriers or other means)			50	25
f. Total Free Distribution (Sum of 15d. and 15e.)			80	40
g. Total Distribution (Sum of 15c. and 15f)			4314	4160
h. Copies not Distributed			20	10
i. Total (Sum of 15g. and h.)			4334	4170
j. Percent Paid and/or Requested Circulation (15c. divided by 15g. times 100)			97.69%	99.03%

16. Publication of Statement of Ownership
☒ Publication required. Will be printed in the December issue of this publication. ☐ Publication not required.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner: Joan Henshaw, Office Mgr. Date: 10-8-04

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

Instructions to Publishers

1. Complete and file one copy of this form with your postmaster annually on or before October 1. Keep a copy of the completed form for your records.
2. In cases where the stockholder or security holder is a trustee, include in items 10 and 11 the name of the person or corporation for whom the trustee is acting. Also include the names and addresses of individuals who are stockholders who own or hold 1 percent or more of the total amount of bonds, mortgages, or other securities of the publishing corporation. In item 11, if none, check the box. Use blank sheets if more space is required.
3. Be sure to furnish all circulation information called for in item 15. Free circulation must be shown in items 15d, e, and f.
4. Item 15h., Copies not Distributed, must include (1) newsstand copies originally stated on Form 3541, and returned to the publisher (2) estimated returns from news agents, and (3), copies for office use, leftovers, spoiled, and all other copies not distributed.
5. If the publication had Periodicals authorization as a general or requester publication, this Statement of Ownership, Management, and Circulation must be published; it must be printed in any issue in October or, if the publication is not published during October, the first issue printed after October.
6. In item 16, indicate the date of the issue in which this Statement of Ownership will be published.
7. Item 17 must be signed.

Failure to file or publish a statement of ownership may lead to suspension of Periodicals authorization.

PS Form **3526**, October 1999 (Reverse)

Government Update continued from page 75

rapidly changing countries. Greenwire quoted Mr. Blair as saying: \"While the eight G8 countries account for around 50 percent of global greenhouse gas emissions, it is vital that we also engage with other countries with growing energy needs—like China and India; both on how they can meet those needs sustainably and adapt to the adverse impacts we are already locked into." Mr. Blair's speech also specifically criticized the Bush Administration's reluctance to acknowledge the threat of global warming and refusal to join multilateral agreements aimed at reducing greenhouse gasses. "I want to secure an agreement as to the basic science on climate change and the threat it poses," Mr. Blair said. "Such an agreement would be new and provide the foundation for further action."

Such an agreement may be contingent upon the results of a meeting in the U.K. prior to the G8. England is hosting an international summit of climate scientists and policy makers who will try to determine capacity of the atmosphere to absorb greenhouse gas and possible methods of global warming mitigation.

For more information about climate change, see http://www.agiweb.org/gap/legis108/climate.html.

EPA: Extension of Comment Period for the Proposed Rule of Standards and Practices for All Appropriate Inquiries.
On August 26, 2004, EPA published for public comment a proposed rule that would set federal standards and practices for conducting all appropriate inquiries (including requirements for the geological aspects to be performed by a Professional Geologist), as required under Sections 101(35)(B)(ii) and (iii) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The proposal is at http://www.tbpg.state.tx.us/CERCLA-Brownfield%20proposed_rule.pdf

The original comment period was to expire on October 25, 2004, but action extended the comment period to November 30, 2004. Submit your comments, identified by Docket ID No. SFUND-2004-0001, to Federal eRulemaking Portal: http://www.regulations.gov. Follow the on-line instructions for submitting comments. If you have questions, contact Patricia Overmeyer of EPA's Office of Brownfields Cleanup and Redevelopment at 202-566-2774 or at Office of Brownfields Cleanup and Redevelopment at 202-566-2774 or at overmeyer.patricia@epa.gov. (September 17, 2004, Volume 69, Number 180). ■

CALL FOR PAPERS

BUDDING NEW TECHNOLOGIES

Southwest Section AAPG 2005 Convention

April 10-13, 2005

Fredericksburg, Texas

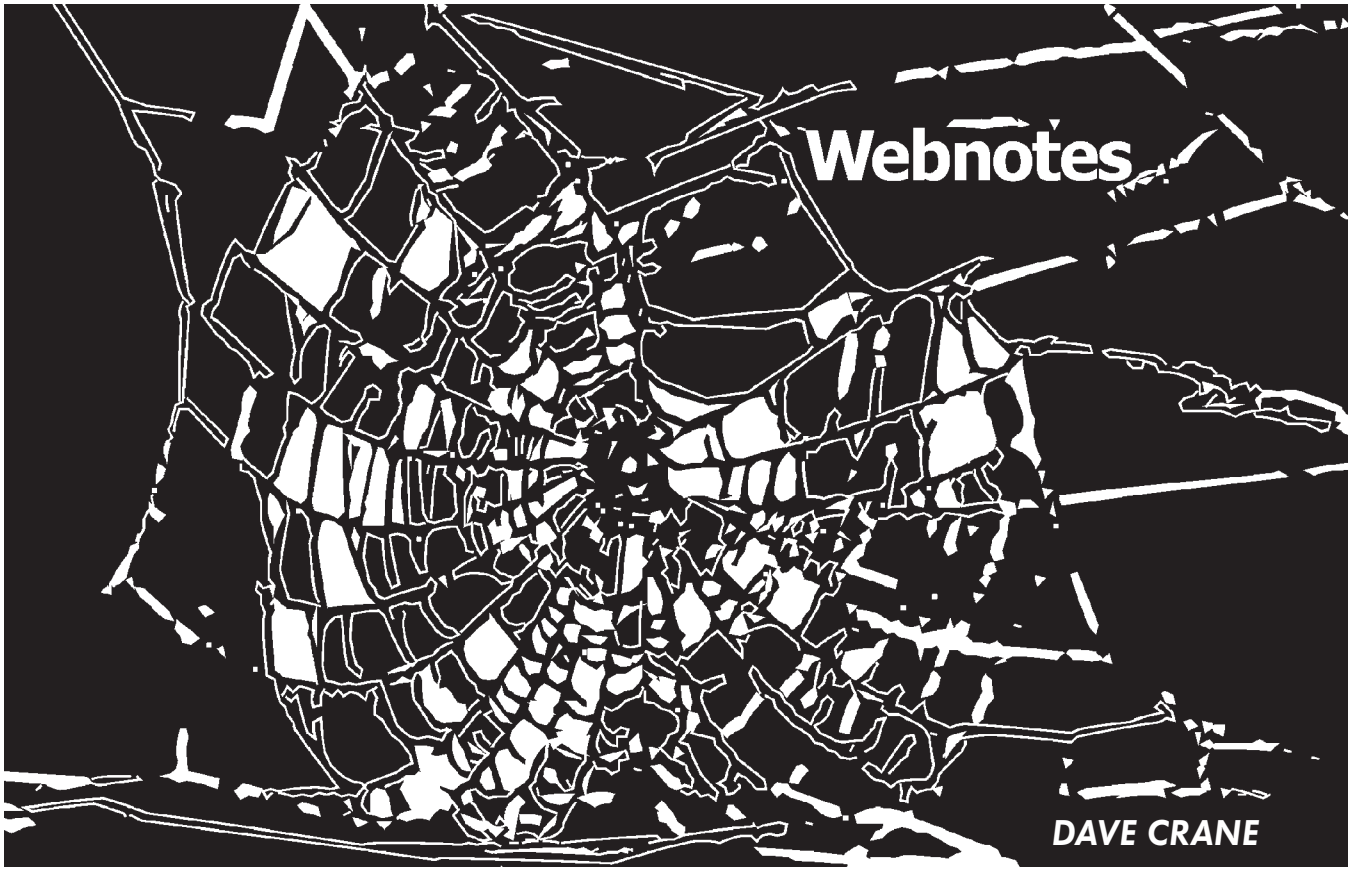
The Southwest Section is seeking paper and poster presentations for the 2005 Southwest Section Convention to be held April 10-13, 2005 in Fredericksburg, Texas. There will be Technical Sessions on Monday, April 11th in the morning and afternoon, and only morning sessions on Tuesday, April 12th and Wednesday, April 13th. We are soliciting papers covering topics from field studies to emerging technologies.

With historical Fredericksburg as the backdrop for the convention, we anticipate a rather sizeable turn out. This would be a great opportunity for you, as an author, to present your work before a large and appreciative audience.

The planned attractions for the convention include a German Festival with an Oompah Band, a Wine and Wildflower Tour, shopping for the spouses and, of course, the ice breaker which will be held at a local brewery. Mark your calendars and watch for coming announcements. If you have any questions about the convention, contact Mike Party (Convention Chairman) at (432) 686-5971 or by email at mparty@wbltd.com. We hope to see you in Fredericksburg!

Deadline for submittal of papers is December 15th 2004.
If you would like to present a paper or poster, please contact:

David J. Sivils, Tom Brown, Inc., dsivils@tombrown.com
(432) 688-9642 (Office) or (432) 682-5034 (Fax)



Website User Groups. What are They?

The HGS Website has a feature called "User Groups." These are essentially interest-group mailing lists that you can sign up for. There is a list of available User Groups on the HGS Website. That location also shows you which User Groups you are in. You must be logged in to see that page.

Not many of these User Groups are in active use, but those that are active have been quite useful. The Committee: International Explorationists Group is a good example. Over 400 people, both members and nonmembers of the HGS, have signed up to receive announcements from this committee. When that committee has a meeting scheduled or wants to publicize an event such as PESGB or APPEX, we can send a special email to everyone on that list at the request of the committee chairman. We can also provide the committee with the mailing addresses and other details on their members.

Most of our monthly Newsletters go to the User Group called Newsletters, but we can be more selective by using the HGS User Group (current and past members of the HGS) or the Active Members User Group (current members only.) We have never needed to send something to people interested in AAPG news, but there is such a User Group if you care to sign up for it. Note that you don't have to be a member of any of these societies or committees to sign up—they simply indicate an interest on your part. You won't be able to sign up for Active Members but, generally speaking, most groups are open to everyone.

The latest addition to our User Groups is Texas Geologist Licensing. We intend to use it for special announcements of interest to licensed geologists and anyone interested in licensing.

Keep your interest profile up to date. Go to the User Groups list periodically and update your preferences. If you are a committee chairman or responsible for a related organization, contact the HGS Webmaster for more information on how you can make use of User Groups. ■

For additional information on this article, please contact:

David Crane
713-789-5916
webmaster@hgs.org

HGA *and* GeoWives **News**

HGA

by Vicky Pickering, Third Vice President

The Holiday Season will be enjoyed with many activities, one of which is the HGA Holiday Luncheon and Music Show on Thursday, December 16, 2004. HGA members and guests are invited to attend at the Lakeside Country Club. The husband and wife team, Steve and Diana Warner, "The Ivory Touch," will entertain us with music. The chairpersons are Sally Blackhall and Norma Jean Jones. Members, look for your invitation to arrive in the mail and make your reservation in early.

Meetings for 2005 include Bridge/Game Day Luncheon on February 14 at the Junior League; Luncheon and Fashion Show on March 31 at the Houston Racquet Club; the Installation of Officers Luncheon with musical entertainment on May 12 at the Briar Club.

Bridge Groups will meet on second Thursday and third Wednesday.

- Second Thursday "Cinco-Mas" bridge group meets at the Junior League, 1811 Briar Oaks. Call Audrey Tompkins for reservations at 713-686-0005.

- Third Wednesday the Petroleum Club Ladies Bridge meets at the Petroleum Club at 800 Bell. Call Daisy Wood at 713-977-7319 for reservations.

Membership Information

Wives of HGS members, widows of deceased HGS members and HGS female geologists are eligible to join HGA. Mail dues to Margaret Jones, 1407 Lakecliff, Houston, TX 77077. See the membership form in this or previous issues of the *Bulletin*.

As a member are invited to join

GeoWives

2004–2005 dues are $7.50

make check payable to *GeoWives* and mail to:

Dene Grove
12715 Pebblebrook
Houston, Texas 77024

Please provide the following

Name: _____

Sreet Address: _____

_____

City/State/Zip: _____

Telephone: _____

email: _____

I will help plan a GeoWives activity ☐
I will serve on a committee ☐
Notification / Phone Committee ☐
Courtesy / Hostess ☐
My home is available for a meeting ☐

You are invited to become a member of

Houston Geological Auxiliary

2004–2005 dues are $20.00

make check payable to *Houston Geological Auxiliary* and mail to: Margaret Jones • 1407 Lakecliff Dr • Houston, Texas 77077

HGA YEARBOOK INFORMATION

Last Name	First Name	Name Tag
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